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NATIONAL GEOGRAPHIC SOCIETY PROGRAM FOR MARCH, 1896.

Annual Reception, Arlington Hotel, March 12.

Reception to the Venezuelan Commission, by the Society, at the Arlington Hotel from 9 to 12, Thursday evening, March 12.

Members can obtain extra tickets at $1.50 each by application to the Secretary of the Society.

Friday Evening Lectures, 8 to 9.15 p. m., Metzerott Hall.

Mar. 13.—A Voyage on a steam-whaler to the Antarctic Continent: HERR BORCHGREVINK, of Norway. (Lantern-slide illustrations.)

Mar. 27.—The geographic History of Currency: JAMES H. ECKELS.

Monday Afternoon Lenten Lectures, 4.15 to 5.30 p. m., Metzerott Hall.

(Lantern-slide illustrations.)

Mar. 2.—Across the Canadian Plains to Banff, Alberta: W J McGEE. Excursion to Mt. Rainier, Washington: BAILEY WILLIS.

Mar. 9.—Glaciers, Peaks, and Canyons of the Rockies: CHARLES E. FAY.

Mar. 16.—From the Canadian National Park to the Pacific: JAMES FLETCHER.

Mar. 23.—From Puget Sound to Sitka; Fiords, Islands, and Canals: A. P. NIBLACK.

Mar. 30.—The Glaciers of Alaska: HARRY FIELDING REID.

Technical Meetings, Cosmos Club Hall, 8 to 10 p. m.

Mar. 6.—The Adaptations of Plants to Desert Environment: F. V. COVILLE. (Lantern-slide illustrations.)

Mar. 20.—On the physiographic Development of the District of Columbia Region: N. H. DARTON. (Lantern-slide illustrations.)

Use of geodetic Control Lines in geographic Work: GILBERT THOMPSON.

Admission to meetings is by membership ticket, admitting two. Members can obtain extra tickets, each admitting one person to a single evening lecture, for fifty cents, at the office of the Secretary, 1517 H street; office hours, 10 A. M. to 12.30 P. M., and 3 to 5 P. M.; Saturdays, 10 A. M. to 1 P. M.

Extra tickets for the afternoon lectures, 25 cents each or $1.50 for the course of seven lectures, can be obtained at the office of the Secretary or at Metzerott's music store.

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XUM

THE

National Geographic Magazine

VOL. VII MARCH, 1896 No. 3

THE SO-CALLED "JEANNETTE RELICS"

By PROFESSOR WILLIAM H. DALL

Much interest has been excited by the recent rumor that news had been received from Nansen, via Siberia. In discussing the rumor I mentioned that the supposed relics of the *Jeannette* found off Julianehaab, in Greenland, were in all probability in no way connected with the *Jeannette* expedition, but were due to a boyish prank of some of the members of the Greely relief expedition of 1884. In attempting to formulate his impressions of an interview with me during which the subject was discussed, and which were not revised by me, the reporter unfortunately fell into some inaccuracies, not unnatural in a person unfamiliar with the technicalities of arctic exploration, but for which the telegrams to the press made me responsible. It seems desirable, therefore, to lay before those interested in such matters a statement of the facts bearing on the two questions involved, namely, Were the relics really derived from the *Jeannette* expedition? and, if not, were they the result of a mystification, as above suggested? The first is of course the only one of importance to geographers, for if the relics were spurious it matters but little whence they were derived. The facts are now in order.

1. The *Jeannette* sank June 11, 1881, in the Arctic sea, about 180 miles northwest from the New Siberian islands.

2. The Greely relief expedition of 1884 reached the coast of Greenland in May; the *Bear* met the pack ice near Godhavn about May 13; the *Thetis* and *Loch Garry*, May 22; the *Alert* on

June 5. The latter left Godhavn June 9 and reached Upernivik June 13.

3. On June 18 some Eskimo found on the surface of an ice floe off Julianehaab, in southwest Greenland, some articles, which were turned over to the Danish officer in charge of that settlement, Herr Lytzen, who sent them to a friend in Copenhagen. These comprised, among other things, some broken biscuit boxes, a pair of oilskin trousers, said to have been marked Louis Noros (the name of one of the *Jeannette* survivors, who was a member of the Greely relief expedition of 1884), and a number of written papers, especially a list of the boats of the *Jeannette*, and a list of provisions signed by De Long, the commander of the *Jeannette* expedition, and stated to be entirely in his or a single handwriting.

4. The Greely relief expedition left Greenland from Godhavn July 9, without touching at Julianehaab.

5. In the latter part of the winter of 1884–'85 a Danish correspondent wrote to Dr Emil Bessels, formerly of the *Polaris* expedition and a well-known arctic expert, at Washington, stating that news of these various relics had been received in Copenhagen and requesting his opinion as to their authenticity. The substance of this letter was communicated to me by Dr Bessels, who was much interested in the find, as, if genuine, it obviously furnished important data toward a knowledge of the drift in the polar regions. The presence in Washington during 1885 of many members of the relief expedition, in connection with the various investigations which followed their return, enabled Dr Bessels to interview many of the seamen as well as their officers and to accumulate a large mass of notes from his examination of them. On one or two occasions I was invited to be present when some of these men called on Dr Bessels. The well-known tendency of articles on the surface of ice, under the influence of the sun, to sink through it to the level of the water—even such trifles as bird's feathers or dead leaves being rapidly engulfed, as I have often personally noticed—led to doubts as to the possibility of the articles mentioned having remained on the surface of the ice for three years during a drift of 3,000 miles, exposed to the elements. The possibility of the preservation of written papers under such conditions seemed almost incredible. The close approximation of the dates of the presence of the relief expedition on the west Greenland coast and that of the finding of the relics was also suspicious. The testimony of the seamen interviewed was, in

brief, to the effect that the presence of *Jeannette* survivors on the relief expedition had suggested to some one the possibility of producing a sensation in the fleet which for some time followed the foremost vessels; that in a spirit of boyish levity this hoax was conceived and carried out, with no intention of serious deception or thought of the possible consequences. No names were mentioned and the evidence was to the effect that a general impression prevailed among the men that some such prank had been played rather than that any particular man questioned was personally cognizant of the act. Dr Bessels gathered an amount of evidence tending to support this hypothesis, which he showed me and which covered forty or fifty pages of foolscap. This record was afterward burned, with his library and other papers, in a fire which destroyed his residence at Glendale, D. C. In consequence Dr Bessels communicated to his European correspondents his belief that the relics were fictitious and the result of a hoax. I stated to Dr Rink and others who inquired of me the same conclusions.

6. In 1888 Dr Nansen made his celebrated journey across Greenland and presumably heard of the relics there. Before his return, Dr Bessels died in Germany, where he had taken up his residence. Up to this time either the doubts which had been thrown on the authenticity of the relics, or some other reason, had prevented them from exciting much interest, and the owner seems to have resisted any attempt to verify their authenticity by sending photographs or originals of the papers to America when requested. The papers and other objects were placed in a box in a garret and, after the death of the owner, were burned as worthless, with the acquiescence of the widow. As Herr Lytzen had published an account of them (Geogr. Tidskr., viii, 1885–'88, pp. 49–51) and the finder and possessor alike acted in perfect good faith throughout, it is probable that after Dr Bessels' opinion was communicated to him, the owner attached no great value to the objects, otherwise his wife could hardly have been ignorant of it.

When Dr Nansen endeavored to examine these objects with a view of determining their authenticity, they were no longer in existence.* One of his friends, whose name has slipped my memory and whose letter is temporarily inaccessible, wrote to me on Nansen's behalf, as he explained, asking my opinion,

*See Roy. Geog. Soc. Proc., Nov. 14, 1892, in Geog. Journal, Jan., 1893, pp. 1–32.

which was sent some time before the starting of Nansen's latest expedition. Baron Nordenskiöld was also informed some time before Nansen sailed, so that there is no doubt that Nansen was cognizant of the fact that the authenticity of the relics was seriously questioned. He had previously admitted as much in his paper above cited, but did not on that account relax his faith in them.

Conclusions.—It is evident that the proof that the relics were the result of a hoax is not complete, and, in the nature of things, unless the parties actually concerned shall admit it, is never likely to be completed. Each person will form his own opinion from the data submitted. I have spent some ten years of my life at sea, nearly half of the time in command of a United States surveying vessel, and I am quite aware of the nature of sailor men and sailors' evidence. Dr Bessels was for years my intimate and valued friend and associate, and in all our intercourse nothing ever occurred to lead me to doubt his earnest endeavor to get at the truth of this matter. My own conclusions are, first, that the relics were not authentic, and, second, that they were probably due to a hoax, as stated above. In support of the first conclusion, beside the data given, the probability that De Long himself would be writing out receipts for stores is very small. There has been since 1848 an average of two or three ships a year lost in the ice north of Bering strait, and in the vicinity of the point where the *Jeannette* entered the pack. Not a single relic of all the enormous fleet of over one hundred wrecks has ever been identified on the Greenland coast, where wood has always been of the greatest value. Driftwood from northern rivers is cast up on the Greenland coast more or less every year, but there is no evidence that it comes from points east of Nova Zembla. It is not impossible that some of it does, but it cannot be proved. Some twenty-odd years ago a throwing-stick, of the pattern used at Port Clarence, near Bering strait, came ashore on the coast of Greenland, near Godhaab, and was presented to the museum at Christiania by Dr Rink.* When one remembers how the crews of whaleships collect curios which they carry to all parts of the world, and which are often thrown away or lost in the most unexpected places, the certainty that this stick drifted from Port Clarence, a distance of not less than 4,000 miles, is evidently not to be taken for granted. I have received from lagoons on the

*Cf. Geog. Tidskr., ix, No. 4, pp. 75–6, Copenhagen, 1887.

west side of the peninsula of Lower California, formerly frequented by whalers, marine shells unquestionably of north European origin, *Buccinum undatum* especially, which is not known in the Pacific at all, and I have also received Indo-Pacific species, as well as cocoanut shells, collected by John Murdoch, from the shores of the Arctic ocean, north of Bering strait. That the drift of the *Jeannette* was due to the prevalent winds is beyond question, as already shown by Melville, and as may be worked out by anybody from the data. That, if continued, it would have passed across the Pole, as argued by Nansen, is a pure assumption, though a very enticing one. Certainly no one interested in arctic work but must most heartily wish that that courageous explorer may succeed in proving his hypothesis and return in safety to claim the laurels his success would earn.

In regard to the second point, that of the origin of the so-called relics, if regarded as fictitious, I have already stated my conclusion that the story of the hoax seems sufficient to account for them. To be perfectly impartial, however, one must admit that the currents about southwest Greenland are such that objects set adrift on the ice from any great distance to the northward of Julianehaab would usually be set over to the westward rather than in shore, although this general rule is subject to exceptions, due to strong westerly winds. This fact alone I suspect was sufficient to satisfy Nansen, whose hypothesis was already framed; but it must be remembered that the Greenland current does not round cape Farewell with equal strength at all seasons of the year; that the advent of the relief expedition was exceptionally early; the influx into Baffin's bay had not begun, and that along such a coast as that of Greenland eddies and reverse currents cannot fail to occur. While not without weight, I cannot assign to Nansen's objection sufficient weight to overcome the other indications, which for me, at least, lead to the conclusion that the so-called *Jeannette* relics have not been shown to have any certain connection with the *Jeannette* expedition. Furthermore, there is no certainty that the Alaskan throwing-stick was brought to the coast of Greenland by oceanic currents, and even if it was, the time occupied in the transit and the route are alike absolutely unknown, so that speculations as to a drift across the region of the Pole receive from this incident no positive confirmation.

Admiral Sir E. Inglefield, the distinguished Arctic traveler, at the meeting of the Royal Geographical Society called to discuss

Nansen's plans, told of finding a fresh stick of Siberian pine, with the bark still upon it and which seemed to have been only a few months in the water, on the west shore of Wellington channel, which enters Baffin's bay from the west.* If such a tree could be carried eastward in a few months from Siberia to a point accessible by ships from Baffin's bay, why is it not more probable that this throwing-stick, lost near Port Clarence, was carried north and east by the well-known northeasterly shore current past point Barrow and so on to Baffin's bay and the Greenland coast?

At this meeting such Arctic authorities as Admiral Sir George Nares, Captain Wharton, Hydrographer R. N., ex-Hydrographer Sir George Richards, R. N., and Sir Joseph Hooker united in the opinion that nothing was known about the direction or existence of sea currents in the region Nansen hoped to traverse, and that all opinions in regard to them must be purely speculative. The doubtful character of the so-called *Jeannette* relics was also distinctly pointed out.† It cannot be said therefore that Nansen pursued his plans in ignorance of the doubtful elements of his hypothesis, but rather that his courage, energy, and audacity were such that he was willing to risk everything to put his speculations to a final test.

NANSEN'S POLAR EXPEDITION

By General A. W. Greely,

Chief Signal Officer, United States Army

The continuing interest of the unsolved polar mystery has been strikingly illustrated by the eagerness with which the press of the world has caught at every word that seems to indicate the success and safety of the brave Norwegian in his dangerous drift-voyage toward the north pole.

Dr Fridtjof Nansen, born in 1861, became famous by crossing, first of all men, the inland ice of Greenland in 1888 from Umivik, 64° 45′ north, on the east coast, to Kangersunek fiord, 50 miles south of Godthaab. Later, he conceived a novel and dangerous plan for polar work. Ignoring the accepted rules of

*Geographical Journal, Jan., 1893, p. 25.

† Op. cit., pp. 22-32.

DR FRIDTJOF NANSEN

ice navigation—of avoiding besetment and following the protected lee of land-masses—he decided to put his ship into the ice to the north of the New Siberian islands, whence he believed that he would be carried by ocean currents across the pole to the Spitzbergen sea. His steamer, *Fram*, 125 feet long, with an oak hull 30 inches thick and sheathed with greenheart, was built so as to rise under ice pressure, as he claimed. The crew of twelve were provisioned for five years, though he expected, by a drift of a little over two miles per day, to reach the Atlantic in two years. No explorer of experience endorsed the plan, but with undaunted courage Nansen sailed June 24, 1893, and entering the sea of Kara was last seen to the east of Nova Zembla in September, 1893. He visited neither the Taimur peninsula nor the New Siberian islands, as events have since shown.

February 13, 1896, a dispatch from Irkutsk, on the authority of Konchnareff, an agent of Nansen, stated that the explorer, having reached land-masses at the North Pole, was now returning. Two days later a dispatch from Archangel confirmed the first report in general terms only. From the beginning no credit was given to these dispatches by any American arctic explorer or student. Melville, Schutze, Dall, and the writer were strenuous in disbelief, but the story was credited by scores of persons, both in Europe and this country, who did not find it peculiar that a story from the center of Asia was confirmed from the north of Europe, nor were surprised that such news came from the Siberian ocean in midwinter. Through the Norwegian press Nansen's relatives announce their disbelief in this rumor.

As to the drift-relics found on the west coast of Greenland, which were relied on by Nansen as practical proof that his theory of a drift voyage was correct, it may be said that Melville, the man best qualified to speak about the *Jeannette*, denied at the time their genuineness and endeavored without avail to have them brought to this country. The writer publicly called Nansen's attention to this question, which for the first time seems to have created doubts in his mind. Nansen made efforts to find the relics for verification, but they had disappeared *in toto*.

While Nansen's journey is exceedingly dangerous, it would not be astonishing if he was able to return from his ship, if it was lost south of 81° north, to the Asiatic coast, but if he really approached the North Pole, as is possible, before his vessel was destroyed, it is safe to say that he will pay for an unequaled

latitude with his life and carry the secret of his well-earned success to his grave.

The numerous errors lately set forth in the press indicate the need of accurate data relative to latitudes attained.

The tendency to unfairly present data in the interests of individuals or nations is of constant occurrence, and it is not surprising that the general public should be unfamiliar with all the facts. This is especially true in Arctic matters, as is shown by the North Polar chart in "The Times Atlas," 1895, so much lauded for its fullness and accuracy. On this chart the highest north of the German, Swedish, and English (Parry's, 1827) expeditions is so described in full by text and latitudes. In the case of Beaumont, the English explorer, his latitude is given as 82° 54′ north, which is 33 miles too far north, and his record is spread on the map above that of Lockwood, while the last-named explorer, who actually made the highest north ever attained, has not even his latitude entered. In this remarkable case of *suppressio veri* an American explorer loses his nationality, his latitude, and his hard-earned record, all other nationalities having their data entered in full.

Under these conditions it seems to be rendering a geographical service to reproduce here a table extracted from a "Handbook of Arctic Discovery," written by myself.

*Records of the Highest North made since 1587 in the Eastern and Western Hemispheres by Land and by Sea.**

EASTERN HEMISPHERE.

Commander.	Date.	N. lat.	Long.	Locality.
William Barents ..	July 14, 1594	77° 20′	62° E.	Near cape Nassau, N. Z.
Ryp and Heemskerck (Barents' third voyage).	June 19, 1596	79° 49′	12° E.	N. Spitzbergen.
Henry Hudson....	July 13, 1607	80° 23′	10° E.	Spitzbergen sea.
J. C. Phipps	July 27, 1773	80° 48′	20° E.	" "
William Scoresby..	May 24, 1806	81° 30′	19° E.	" "
W. E. Parry	July 23, 1827	82° 45′	20° E.	" "
Nordenskiold and Otter.	Sept. 19, 1868	81° 42′	18° E.	Spitzbergen sea, highest by ship.
Weyprecht and Payer.	April 12, 1874	82° 05′	60° E.	Franz Josef Land, by Payer, *highest land.*

* NOTE.—This table is reproduced by permission of Roberts Brothers, Publishers.

WESTERN HEMISPHERE.

Commander.	Date.	N. lat.	Long.	Locality.
John Davis.....	June 30, 1587	72° 12′	56° W.	W. Greenland.
Henry Hudson....	June 20, 1607	73°	20° W.	Off E. Greenland.
William Baffin....	July 4, 1616	77° 45′	72° W.	Smith sound.
E. A. Inglefield....	Aug. 27, 1852	78° 21′	74° W.	Smith sound.
E. K. Kane.....	June 24, 1854	80° 10′	67° W.	Cape Constitution, Greenland, by Morton.
C. F. Hall.....	Aug. 30, 1870	82° 11′	61° W.	Frozen sea.
C. F. Hall.....	June 30, 1871	82° 07′	59° W.	Greenland, by Sergeant Meyer, Signal Corps, U. S. Army.
G. S. Nares.....	Sept. 25, 1875	82° 48′	65° W.	Grinnell Land, by Aldrich.
G. S. Nares.....	May 12, 1876	83° 20′	65° W.	Frozen sea, by A. H. Markham.
A. W. Greely.....	May 13, 1882	83° 24′	41° W.	New Land, north of Greenland, by Lockwood and Brainard.

Doubtless the name of some whaler should follow that of Baffin in the above list, but the inexactitude of most high latitudes reported by whalers is well known. Possibly the reported northing of Lambert, 78½ degrees north, in 1670, on the east Greenland coast, may have exceeded Inglefield's exact latitude of 78° 21′.

Sweden holds the *ship's* record in the old world, but Parry beat it by *boats*. It will be noted that England held the honors of the farthest north through Hudson, 1607; Phipps, 1773; Parry, 1827, and Nares, by Aldrich, 1875, and by Markham, 1876. This record, unbroken for 275 years, passed to the United States through the efforts of the International Polar Expedition, under Lieutenant Greely, which, by Lockwood and Brainard, reached 83° 24′, the most northerly point, whether on sea or land, ever attained by man, which Nansen or Jackson may possibly excel.

Among other high latitudes attained, but not pertinent to this table, are the following: Hayes, about 80° 10′, in 1861; Jackson, 81° 20′, in 1895; Peary, 81° 37′, in 1891 and 1895; Beaumont, 82° 21′, in 1876; Pavey (with Greely), 82° 54′, in 1882, and Aldrich, 83° 07′, in 1876.

THE SUBMARINE CABLES OF THE WORLD

By Gustave Herrle

The English give Professor (afterward Sir) Charles Wheatstone the credit of being the originator of submarine cables, that gentleman having laid before the House of Commons in 1840 a scheme for the laying of a telegraph cable across the channel between Dover and Calais, but his plans do not seem to have been fully matured.

In the United States, in 1842, Professor S. F. B. Morse experimented with a submarine cable between Castle Garden and Governor's island, New York harbor, and a year later, in detailing the results of his experiments with an electro-magnetic telegraph in a letter to the then Secretary of the Treasury, J. C. Spencer, he said:

. . . "The practical inference from this law is that a telegraphic communication on the electro-magnetic plan may with certainty be established across the Atlantic. Startling as this may seem now, I am confident the time will come when this project will be realized." . . .

It was not, however, until 1850 that the first submarine cable in the open sea was laid. This was the cable across the channel between Dover and Calais. It was made of copper wire, covered with gutta-percha to half an inch in diameter, the shore ends of the wire being doubly covered with cotton, overlaid with a coating of India rubber, and the whole inclosed in a thick lead pipe. This cable did not work successfully, on account of defective insulation, and had to be abandoned. Another authority states that telegraphic communication was maintained for a few hours, when it was suddenly interrupted, the cause being, as was afterwards discovered, the cutting of the cable by a French fisherman, who, it is said, exhibited a piece of it to the astonished people of a neighboring town as a rare specimen of sea-weed with its center filled with gold. Be that as it may, to guard against such casualities the new cable, laid in the following year (1851), between Dover and Calais, was made much stronger, consisting of a wire insulated with gutta-percha and forming a core to a wire rope as a protector. This cable was an entire success, and,

as a consequence, the establishment of a number of short submarine cables in Europe and America followed shortly afterward.

In 1854, Mr Cyrus W. Field, whose memory will ever be dear to the hearts of Americans, took up, in company with American and English capitalists, the project to connect Europe and America by a submarine cable, and on August 7, 1857, the laying of the first Atlantic cable was begun by the U. S. frigate *Niagara*, which sailed from Valentia, Ireland, in the direction of Heart's Content, Newfoundland. When about 400 miles had been laid, the cable broke and the steamer returned. In the following year, 1858, the attempt was renewed, H. M. S. *Agamemnon*, with one portion of the cable, and the U. S. frigate *Niagara*, with the other portion, meeting in mid-ocean, in about latitude 52° 02′ north, longitude 33° 18′ west, to splice the cable there, and then to lay it, one ship sailing eastward and the other westward. In this attempt also the cable broke and the steamers returned to port, but a sufficient length of cable being left, another attempt was made later in the year and the laying was successfully accomplished over the whole distance. America and Europe were united by telegraphic communication on August 5, and congratulatory messages were exchanged between the two continents. This is what the Queen of England telegraphed to the President of the United States:

"The Queen desires to congratulate the President upon the successful completion of this great international work, in which the Queen has taken the deepest interest. The Queen is convinced that the President will join with her in fervently hoping that the electric cable which now connects Great Britian with the United States will prove an additional link between the nations whose friendship is founded upon their common interest and reciprocal esteem. The Queen has much pleasure in communicating with the President, and renewing to him her wishes for the prosperity of the United States."

To this President Buchanan replied as follows:

"The President cordially reciprocates the congratulations of Her Majesty the Queen on the success of the great international enterprise accomplished by the science, skill, and indomitable energy of the two countries. It is a triumph more glorious, because far more useful to mankind, than was ever won by conqueror on the field of battle. May the Atlantic telegraph, under the blessing of Heaven, prove to be a bond of perpetual peace and friendship between the kindred nations, and an instrument destined by Divine Providence to diffuse religion, civilization, liberty, and law throughout the world. In this view will not all nations of Christendom spontaneously unite in the declaration that it shall be forever neutral, and that its communications shall be held sacred in passing to their places of destination, even in the midst of hostilities?"

But, alas, the joy over the greatest triumph of the age was destined to be of short duration. In less than a month the cable refused to work, owing to some fault the nature of which could not be definitely ascertained. It was at last abandoned in despair, and no further attempt to lay another one was made until 1864, when the Atlantic Telegraph Company made with the Telegraph Construction and Maintenance Company a contract for a new cable between Valentia and Heart's Content and chartered the steamship *Great Eastern* to lay it. This cable was 2,273 nautical miles* long, and its weight was 300 pounds per mile. Its laying down commenced on July 23, 1865, Mr Cyrus W. Field being on board the ship, but on August 2, after about 1,400 knots had been paid out, the cable parted and the broken end disappeared from view. The *Great Eastern* remained near the scene of the accident until August 11, when she gave up the attempt to recover the cable and returned to Europe. Thus another hope, another aspiration, was buried, and we may well imagine the feelings of those who had put their faith and their money into the undertaking.

The story of this attempt and of the successful recovery of the lost cable a year later by means of grapnels from a depth of over 2,000 fathoms forms one of the most interesting chapters in the history of submarine telegraphy; but after all the disheartening failures which had attended the laying of the first three Atlantic cables, the indomitable pluck and energy of Mr Field and his associates were to be finally rewarded with success. A new cable was ordered, and on July 13, 1866, the *Great Eastern* again started from Valentia and, without further serious mishap, finished the laying over the whole distance on July 27, when the cable was spliced to the shore end at Heart's Content. Moreover, on September 1 following, the *Great Eastern* recovered the lost cable of the previous year, spliced it to the cable on board, and completed the laying of it toward Heart's Content, thus establishing a duplicate line. Ever since that time we have had uninterrupted telegraphic connection with Europe, and this 1866 cable thus became the pioneer of the long-distance, deep-sea cables.

Immense progress has since been made in the establishment of submarine telegraph lines. A fleet of between thirty-five and forty steamers, specially constructed and equipped for cable

*A nautical mile, as defined by the United States Coast and Geodetic Survey, equals 6,080.27 feet, or 1.1516 statute miles.

service, sprang into existence, and the present total length of the submarine cables of the world is, in round numbers, 160,000 nautical miles, or enough to girdle the earth seven and one-half times at the equator. At an average cost of $1,200 per mile, the entire system represents an outlay of $192,000,000. Of the total mileage about one-eighth is under the control of various national governments.

The Hydrographic Office issued, in 1892, a book on "Submarine Cables," prepared by Mr G. W. Littlehales as a part of the report of that Office on the survey made by the U. S. ships *Albatross* and *Thetis* for an ocean cable route between San Francisco and Honolulu. It contains a large amount of interesting information, including valuable statistical data, among which is a complete list of the Submarine Cables of the world, in detail. The tables being much too voluminous for publication in these pages, the following list of the more important cables has been compiled from them, the reader being referred to the original report for information concerning the shorter cables and for more complete data generally:

CABLES OVER FOUR HUNDRED NAUTICAL MILES LONG, OPERATED BY GOVERNMENTS.

France: Marseilles to Algiers, 3 cables, 488, 496, and 500; Teneriffe to St. Louis, Senegal, 865.

Cochin China and Tonkin: Cape St. James to Thuan-An (Hué), 530.

British India: Manora to Jask, 531; Jask to Bushire, 2 cables, 519 and 500.

CABLES OVER FOUR HUNDRED NAUTICAL MILES LONG, OWNED BY PRIVATE COMPANIES; ALSO TOTAL LENGTH OF CABLES OPERATED BY EACH COMPANY.

Direct Spanish Telegraph Company, total, 708: Kennack Cove, Cornwall, to Las Arenas, near Bilbao, 487.

Halifax and Bermuda Cable Company: Halifax, N. S., to Hamilton, Bermuda, 850.

Spanish National Submarine Telegraph Company, total, 2,159: Cadiz to Santa Cruz de Teneriffe, 864; Tejita, Teneriffe, to St. Louis, Senegal, 865.

West African Telegraph Company, total, 3,015: Kotonu to St. Thomas, 486; St. Thomas to Loanda, 760.

Great Northern Telegraph Company, Europe and Asia, total, 6,932; Newbiggin, England, to Arendal, Norway, 424; Newbiggin to Marstrand, Sweden, 510; Newbiggin to Hirtshals, Denmark, 420; Amoy to Gutzlaff, China, 590; Gutzlaff to Nagasaki, Japan, 427; Gutzlaff to Nagasaki, 416: Nagasaki to Vladivostock, Russia, 2 cables, 753 and 766.

Eastern Telegraph Company, total, 27,453: Porthcurno, Land's End, England, to Lisbon, Portugal, 2 cables, 850 and 892; Porthcurno to Vigo, Spain, 622; Gibraltar to Malta, 2 cables, 1,118 and 1,126; Marseilles, France, to Bona, Algeria, 2 cables, 447 and 463; Trieste, Austria, to Corfu, 503; Malta to Alexandria, Egypt, 2 cables, 928 and 911; Suez, Egypt, to Suakim, Soudan, 3 cables, 936, 811, and 811; Suez to Aden, 794; Suez to Perim Island, 1,331; Suakim to Perim Island, 597; Suakim to Aden, 2 cables, 794 each; Aden to Bombay, 3 cables, 1,850, 1,859, and 1,885.

Eastern and South African Telegraph Company, total, 6,796 (increased since 1892 to 8,841): Aden to Zanzibar, 1,909; Zanzibar to Mozambique, 2 cables, 644 and 686; Mozambique to Lourenço-Marques, Delagoa bay, 970; Cape Town to Port Nolloth, 433; Port Nolloth to Mossamedes, 1,052.

Eastern extension, Australasia, and China Telegraph Company, total, 17,342: Madras to Penang, 2 cables, 1,462 and 1,389; Rangoon to Penang, 864; Singapore to Saigon, Cochin China, 628; Haïphong, Tonkin, to Hongkong, 470; Fuchau to Hongkong, 472; Saigon to Hongkong, 990; Saigon to Thuan-An, 516; Hongkong to cape Bolinao, island of Luzon, 529; Singapore to Batavia, Java, 541; Singapore to Banjuwangi, Java, 921; Banjuwangi to Port Darwin, Australia, 2 cables, 1,143 and 1,124; Banjuwangi to Roebuck bay, Australia, 892; Sydney to Nelson, New Zealand, 2 cables, 1,284 and 1,322; Hongkong to Fuchau, 472; Fuchau to Shanghai, 449.

Anglo-American Telegraph Company, total, 10,400 (increased to 12,290 since 1892): Valentia, Ireland, to Heart's Content, Newfoundland, 3 cables, 1,846, 1,881, and 1,890; Minou, France, to St. Pierre, 2,718; St. Pierre to Duxbury, Massachusetts, 809.

Direct United States Cable Company, total, 3,099: Ballinskelligs bay, Ireland, to Halifax, 2,564; Halifax to Rye Beach, New Hampshire, 535.

Compagnie Française du Télégraphe de Paris à New York, total, 3,496: Brest to St. Pierre, 2,282; St. Pierre to Cape Cod, Massachusetts, 828.

Western Union Telegraph Company, total, 7,743: Penzance, England, to Canso, Nova Scotia, 2 cables, 2,531 and 2,576; Canso to New York, 2 cables, each 888.

The Commercial Cable Company, total, 6,938 (since increased to 9,075): Havre to Waterville, Ireland, 510; Waterville to Canso, 3 cables, 2,138, 2,350, and 2,388, Canso to New York, 841; Canso to Rockport, Massachusetts, 519.

Brazilian Submarine Telegraph Company, total, 7,369: Lisbon to Madeira, 2 cables, 627 and 631; Madeira to St. Vincent, Cape Verde island, 2 cables, 1,168 and 1,209; St. Vincent to Pernambuco, Brazil, 2 cables, 1,862 and 1,872.

African Direct Telegraph Company, total, 2,746: Santiago to Bathurst, 471; Bathurst to Sierra Leone, 463; Sierra Leone to Akkra, 1,020.

Cuba Submarine Telegraph Company, total, 1,500: Cienfuegos to Santiago, Cuba, 3 cables, 400, 420, and 420.

West India and Panama Telegraph Company, total, 4,557: Kingston, Jamaica, to Colon, Panama isthmus, 630; Holland bay to San Juan, Porto Rico, 683; Holland bay to Ponce, Porto Rico, 647; St. Croix to Port of Spain, Trinidad, 541.

Société Française Des Télégraphes Sous-Marins, total, 3,754 (since increased to 4,544): Porto-Plata, Santo Domingo, to Fort de France, Martinique, 787; Fort de France to Paramaribo, Dutch Guiana, 777; Cayenne to Vizeu, Brazil, 662; Santo Domingo to Curaçao, 453.

Western and Brazilian Telegraph Company, total, 3,964 (since increased to 6,144): Maranham to Ceara, Brazil, 406; Ceara to Pernambuco, 476; Bahia to Rio de Janeiro, 837.

Mexican Telegraph Company, total, 1,523: Galveston, Texas, to Tampico, Mexico, 490; Galveston to Coatzacoalcos, Mexico, 822.

Central and South American Telegraph Company, total, 7,497: Salina Cruz, Mexico, to Libertad, Salvador, 434; San Juan del Sur to Panama, 721; Buenaventura to St. Elena, Ecuador, 486; Paita to Callao-Lima, Peru, 553; Callao-Lima to Iquique, Chile, 747; Iquique to Valparaiso, Chile, 877.

West Coast of America Telegraph Company, total, 1,699 (since increased to 1,964): Callao-Lima to Mollendo, Peru, 510.

NOTE ON COMPILATION OF CHART.

This chart (see frontispiece) was compiled in the U. S. Hydrographic Office from the latest information, and is a facsimile of H. O. chart * No. 1530, just issued by that Office.

The twelve cables across the North Atlantic ocean were plotted, from their terminal points on the American continent to meridian 40° west, from positions furnished by the respective cable companies, with the exception of three—the Western Union of 1881 and 1882 and the Mackay-Bennett of 1894—for which positions were furnished all the way across. From the European terminal points to meridian 40° west, the cables, with the exceptions just mentioned, were plotted from information deposited in the Office of Naval Intelligence.

A map furnished by the Western Union Telegraph Company was used for the plotting of the principal connecting land lines in the United States.

The cables and land lines of Japan were taken chiefly from the Outline Map of Japan showing the principal Post, Telegraph, and Railway Routes, published by the Japanese Department of Communications in 1888, and which accompanies "A concise Dictionary of the principal Roads and Chief Towns and Villages of Japan," by W. N. Whitney, M. D., formerly Interpreter at the U. S. Legation at Tokyo.

The other cables and land lines of the World were taken chiefly from the "Carte des Communications Télégraphiques du Régime Extra-Européen dressée d'après des documents officiels par Le Bureau International des Administrations Télégraphiques," Berne, 1888.

The Coaling, Docking, and Repairing Stations of the World and their different grades of facilities were compiled mainly from a publication of the Office of Naval Intelligence, entitled "Coaling, Docking, and Repairing Facilities of the Ports of the World," 1892, and corrections thereto up to December, 1895, and from the British Dock book of 1894.

* This chart is sold by the Hydrographic Office and its agents at 50 cents per copy.

120° 130° 140° 150° 160° 170° 180° 170° 160° 150° 140°

78°

70°

60°

LIAKHOV IS. OR NEW SIBERIA

DE LONG ISLANDS

WRANGELL I.

S I B E R I A

Icy C.

Pt. Barrow

C. Lisburne

Kotzebue Sd.

East C.

C. Pr. of Wales

BERING STRAIT

A L A S K A

GULF OF ANADUIR

NORTON SOUND

St. Lawrence I.

Yukon R.

C. Navarin

St. Matthew I.

Nunivak I.

C. Olintorsk

Karaginski I.

BERING SEA

Kuskokwim B.

Bristol Bay

COOK INLET

Yakutat B.

C. Ozernui

Pribilof Is.

ALASKA PEN.

SHELIKOF STR.

KADIAK

GULF OF ALASKA

C. Kamchatka

OKHOTSK SEA

KAMCHATKA

Komandorski

XUM

SUBM
WIT
COALING, I

170° 160° 150° 140° 130° 120° 110° 100° 90° 80° 70

BEAUFORT SEA

ALASKA

DOMINION

PARRY ISLANDS

PR. PATRICK I.

MELVILLE ISLAND

BATHURST I.

N. LINCOLN

N. DEVON

MELVILLE SOUND

BANKS LAND

BARING LAND

PR. ALBERT LAND

PR. OF WALES LAND

N. SOMERSET

PR. WILLIAMS LD.

COCKBURN I.

BOOTHIA

N. GALLOWAY

VICTORIA LAND

MELVILLE PEN'A

FOX LAND

SOUTHAMPTON I.

HUDSON BAY

Pt. Barrow

Icy C.

C. Bathurst

C. Lisburne

Kotzebue Sd.

East C.

C. Prince of Wales

BERING STRAIT

GULF OF ANADYR

NORTON SOUND

St. Lawrence I.

Yukon R.

St. Matthew I.

Nunivak I.

BERING SEA

Kuskokwim B.

Bristol Bay

Pribilof Is

COOK INLET

ALASKA PEN.

SHELIKOF STRAIT

KADIAK

GULF OF ALASKA

Yakutat B.

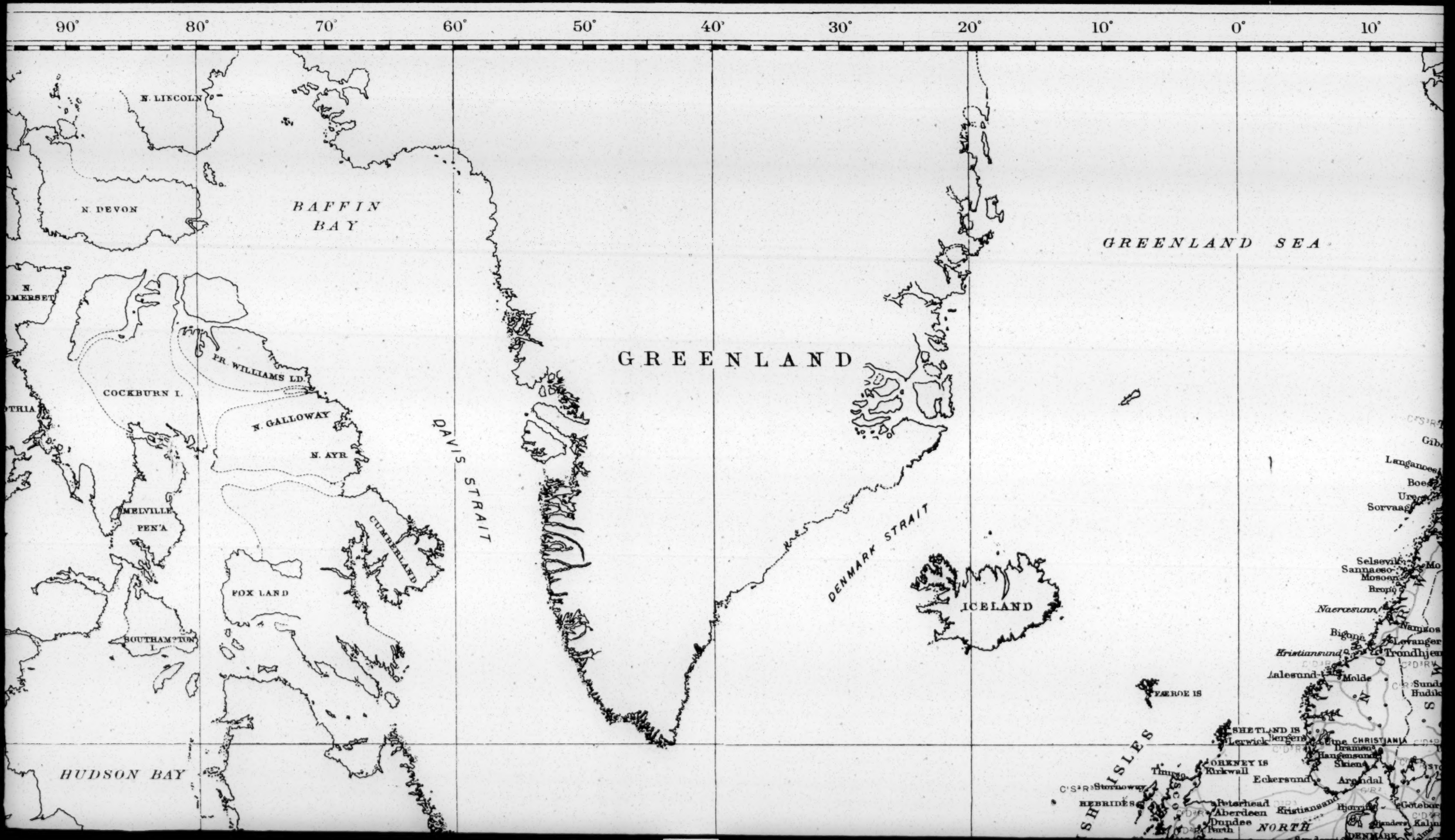
C. Sitka

SUBMARINE CABLES OF THE WORLD

WITH THE PRINCIPAL CONNECTING LAND LINES

ALSO

COALING, DOCKING, AND REPAIRING STATIONS



THE WORLD
LAND LINES
AIRING STATIONS

20° 10° 0° 10° 20° 30° 40° 50° 60° 70° 80°

GREENLAND SEA
BARENTS SEA
KARA SEA
NOVAYA ZEMLYA
ICELAND
DENMARK STRAIT
FÆROE IS
SHETLAND IS
ORKNEY IS
HEBRIDES
NORTH
SCOTLAND
IRISH ISLES
NORWEGIAN SEA
GULF OF BOTHNIA
THE BALTIC
WHITE SEA
RUSSIA
North Cape
Honningsvag Hbr
Gjaesvaer Hbr
Hammerfest
Berlevaag
Vardo
Vadsö
Kistran
Alten
Tromso
Lyngs
Malsnaes
Gibostad
Langanoes
Boe
Sorvaag
Bodoe
Selsevik
Mo
Sannaeso
Mosoari
Brepo
Naeroesund
Namsos
Bigona
Levanger
Kristiansund
Trondhjem
Molde
Aalesund
Sundsvall
Hudiksvall
Haparanda
Tornea
Luten
Pateas
Skellafte
Umea
Nicolaistad
Christinestad
Biorneborg
Nystad
Abo
Helsingfors
Gefle
Upsala
Stockholm
Norrkoping
Arvensburg
Kertel
Hevel
Narva
Pernau
Dome Ness
Riga
Libau
Memel
Eckersund
Arendal
Skien
Hangesund
Drammen
Christiania
Jarlsberg
Larwick
Kirkwall
Thurso
Stornoway
Peterhead
Aberdeen
Dundee
Perth
Glasgow
Edinburgh
Kristiansand
Bjorneborg
Goteborg
Skagen
Kalmar
Sonderrig
Malmo
Visby
Wisby
Hernosand
Soumski Posad
Onega
Arkhangel
Mezen
Vyborg
Kronstadt
ST. PETERSBURG
Moscow
Tobolsk

40° 50° 60° 70° 80° 90° 100° 110° 120° 130° 140°

TS SEA

NOVAYA ZEMLYA

KARA SEA

LIAKHOV IS. OR NEW S

S I B E R I

WHITE SEA

Mezen

Arkhangel

Onega

R U S S I A N E M P I R

Tobolsk

Tomsk

Moscow

Irkutsk

Alexandrovske

OKH

XUM

60° 70° 80° 90° 100° 110° 120° 130° 140° 150° 160°

78°

70°

60°

ZEMLYA

KARA SEA

LIAKHOV IS. OR NEW SIBERIA

DE LONG ISLANDS

S I B E R I A

S S I A N E M P I R E

Tobolsk

Tomsk

XUM

70°
60°
50°
40°
S I B E R I A
WRANGELL I.
Pt. Barrow
Icy C.
C. Lisburne
Kotzebue Sd.
East C.
C. Prince of Wales
BERING STRAIT
ALASKA
GULF OF ANADUIR
NORTON SOUND
St. Lawrence I.
C. Navarin
Yukon R.
St. Matthew I.
Nunivak I.
C. Olintorsk
Karaginski I.
BERING SEA
Kuskokwim B.
Bristol Bay
Pribilof Is.
ALASKA PENIN.
SHELIKOF STR.
KODIAK
GULF OF ALASKA
Yakutat B.
C. Ozernoi
C. Kamchatka
Komandorski
C. Kronotski
OKHOTSK SEA
KAMCHATKA
C. Shipunski
Petropavlovsk
Near Is.
ALEUTIAN ISLANDS
Rat Is.
Andreanof Is.
Unimak
Unalaska
Umnak
C. Lopatka
Alexandrovsk
Alexandrovsk Rd.
Rykovskoie
SAKHALIN I.
KURIL ISLANDS
CHINESE EMPIRE
Soya
Rurumoi
SHIKOTAN I.
Nemuro
Vladivostok
Iwanai
Esashi
Hakodate
Pukuyama
Aomori
Hashinohe
Akita
Kamaishi
SEA OF JAPAN
Sakata
Sendai
Kanazawa
Nagai
Taira
Mito

BEAUFORT SEA

MELVILLE ISLAND

BATHURST I.

N. DEVON

MELVILLE SOUND

BANKS LAND

BARING LAND

PR. ALBERT LAND

PR. OF WALES LAND

N. SOMERSET

PR. WILLIAMS

COCKBURN I.

BOOTHIA

VICTORIA LAND

MELVILLE PEN'A

FOX LAND

SOUTHAMPTON I.

HUDSON BAY

Pt. Barrow

Icy C.

C. Lisburne

C. Bathurst

ELL I.

Kotzebue Sd.

East C.

C. Prince of Wales

BERING STRAIT

GULF OF ANADUIR

NORTON SOUND

St. Lawrence I.

C. Navarin

Yukon R.

St. Matthew I.

Nunivak I.

BERING SEA

Kuskokwim B.

Bristol Bay

Pribilof Is

COOK INLET

SHELIKOF STR.

KODIAK

ALASKA PENA

GULF OF ALASKA

Yakutat B.

Sitka

Unimak

Unalaska

Umnak

ALEUTIAN ISLANDS

Andreanof Is

QUEEN CHARLOTTE IS

Queen Charlotte Sd.

DOMINION OF CANADA

ALASKA

UNITED STATES

New Westminster

Victoria

Whatcom

Tacoma

Townsend

Seattle

Olympia

Astoria

Vancouver

Portland

Empire City

Eureka

Salt Lake City

Denver

Duluth

L. SUPERIOR

Montreal

Quebec

Toronto

ONTARIO

Milwaukee

Chicago

MICHIGAN

Detroit

Toledo

ERIE

Erie

Albany

Buffalo

Pittsburg

Baltimore

YUM

N. DEVON

BAFFIN BAY

GREEN

MELVILLE SOUND

N. SOMERSET

PR. OF WALES LAND

BERT LAND

PR. WILLIAMS LD.

COCKBURN I.

BOOTHIA

N. GALLOWAY

N. AYR

VICTORIA LAND

QAVIS STRAIT

GREENLAND

MELVILLE PEN'A

CUMBERLAND

FOX LAND

SOUTHAMPTON I.

DENMARK STRAIT

ICELAND

FÆROE IS

HUDSON BAY

N O R T H A M E R I C A

BRITISH ISLES

SCOTLAND

HEBRIDES

Stornoway

Glasgow

Londonderry

Belfast

Galway

Liverpool

Limerick

Dublin

Wexford

Valentia

Cork

Darmouth

Penzance

Tilt Cove

Anticosti

Bonne Bay

Tadoussac

Gaspe

GULF OF ST LAWRENCE

NEW FOUNDLAND

Heart's Content

Dalhousie

Amherst

St. Johns

Quebec

Sydney

Cape

St. Pierre

Montreal

Toronto

Kingston

Belfast

Portland

Rye Beach

Boston

Halifax

Duluth

L. SUPERIOR

L. MICHIGAN

L. HURON

L. ERIE

Milwaukee

Chicago

Detroit

Toledo

Erie

Albany

New Haven

Durham

New York

Pittsburg

Philadelphia

Wilmington

Baltimore

WASHINGTON

Cincinnati

St. Louis

Denver

Newport News

Norfolk

Wilmington

U N I T E D S T A T E S

N O R T H

A T L A N T I C

AZORES OR WESTERN IS

Fayal

Terceira

S. Miguel

Rochell

St. Sebastian

Bilbao

Santander

Gijon

Ferrol

Coruna

Vigo

Caminha

Oporto

LISBON

PORTUGAL

S P A I N

Huelva

Vila Real

Cadiz

GREENLAND SEA

BARENTS SEA

GREENLAND

DENMARK STRAIT

ICELAND

FAERÖE IS

SHETLAND IS

ORKNEY IS

HEBRIDES

BRITISH ISLES

NORTH SEA

NORWEGIAN SEA

GULF OF BOTHNIA

BALTIC SEA

GERMANY

FRANCE

SPAIN

PORTUGAL

AUSTRIA

RUSSIA

TURKEY

NORTH

AZORES OR WESTERN IS

Hammerfest

Gjaesvaer Hbr

North Cape

Honningsvaag Hbr

Berlevaag

Tromso

Vardo

Vadsö

Kistran

Alten

Lyngé

Gibostad

Malsnaes

Langancs

Boes

Sorvaag

Bodoe

Selsevik

Sannaeso

Mo

Mosoen

Brofjo

Naerosunn

Namsos

Bigganä

Levanger

Trondhjem

Kristiansund

Molde

Aalesund

Haparanda

Tornea

Lutsa

Pateas

Skellefteä

Heaborg

Brahestad

Umeaa

N Karleby

Nicolaistad

Christinestad

Hernösand

Sundsvall

Hudiksvall

Gefle

Upsala

Björneborg

Nystad

Abo

Helsingfors

Viborg

Kronstadt

ST PETERSBURG

Mezen

WHITE SEA

Soumski Possad

Arkhangel

Onega

Kertel

Revel

Narva

Pernau

Stockholm

Norrköping

Arensburg

Christiansand

Hjorring

Göteborg

Wisby

Dame Ness

Riga

Libau

Kalmar

Malmö

Copenhagen

Rönne

Memel

Königsburg

Danzig

Stettin

Moscow

Helgoland

Cuxhaven

Kiel

Flensburg

Emden

Hull

Grimsby

Liverpool

Holyhead

Dublin

Wexford

Galway

Limerick

Sligo

Londonderry

Belfast

Newcastle

Carlisle

Lowestoft

Milford

Valentia

Cork

Berwick

London

Dover

Amsterdam

Gravenhague

Brussels

Calais

Boulogne

Cherbourg

Havre

Penzance

Darmouth

St Malo

Paris

Brest

Lorient

St Nazaire

Nantes

Rochelle

Bordeaux

Lyon

Berne

Switzerland

Munich

Vienna

Venice

Trieste

Fiume

Pola

Sebenico

Spalato

Ancona

Pescara

Rimini

Ravenna

Ortona

Manfredonia

Rome

Terranova

Naples

Gaeta

Valona

Sardinia

Cagliari

Palermo

Sicily

Messina

Catania

Zante

Smyrna

Belgrade

Servia

Bucharest

Roumania

Bulgaria

Sophia

Philippopolis

Constantinople

Varna

Sulina

Bourgas

Sinope

Samsoun

Baroum

Kilia

Sebastopol

Odessa

Nicolaev

Kertch

Livadia

Azov

Astrakhan

Curiev

Baku

Krasnovodsk

Caspian Sea

Black Sea

Barcelona

Tortosa

Madrid

Mahon

Palma

Alicante

Cartagena

Almeria

Huelva

Lisbon

Oporto

Caminha

Vigo

Coruna

Ferrol

Bayonne

Bilbao

St Sebastian

Santander

Gijon

Cape Finisterre

Bastia

Corsica

Marseilles

Genoa

Payal

Terceira

S Miguel

Hearts Content

St Johns

Cove

SEA

BARENTS SEA

KARA SEA

NOVAYA ZEMLYA

Gjaesvaer Hbr

North Cape

Honningsvag Hbr

Hammerfest

Berlevaag

Tromso

Kistran

Vardo

Vadso

Alten

Gibostad

Lyngen

Malsmaes

Langanoes

Boe

Sorvaag

Bodoe

NORWEGIAN SEA

Selsevik

Sannaeso

Mosoen

Mo

Bronoe

Haparanda

Tornea

Luteå

Pateå

Skellefteå

Heaborg

Brahestad

Umeaa

N. Karleby

GULF OF BOTHNIA

Nicolaistad

Christinestad

Björneborg

Nystad

Abo

Helsingfors

Wiborg

Kronstadt

ST. PETERSBURG

Kertel

Hevel

Narva

Pernau

Arensburg

Dorpat

Riga

Libau

Memel

Königsburg

Danzig

Stettin

Mezen

WHITE SEA

Arkhangel

Soumski Posad

Onega

Naaresunn

Namsos

Bigganæs

Levanger

Trondhjem

Molde

Herrnösand

Sundsvall

Hudiksvall

Gefle

CHRISTIANIA

Drammen

Hangesund

Skien

Arendal

STOCKHOLM

Upsala

Norrköping

Wisby

Göteborg

Kalmar

Malmö

DENMARK

COPENHAGEN

Rönne

Kiel

Hamburg

BERLIN

GERMANY

AMSTERDAM

GRAVENHAGUE

BRUSSELS

MUNICH

VIENNA

BERNE

SWITZERLD

AUSTRIA

Venice

Trieste

Pirano

Pola

Fiume

Sebenico

Spalato

BELGRADE

SERVIA

BUKHAREST

RUMANIA

SOPHIA

BULGARIA

CETTINE

Ancona

Leghorn

Rimini

Pescara

Manfredonia

Naples

Bari

Gallipoli

PHILIPPOPOLIS

CONSTANTINOPLE

Genoa

Bastia

CORSICA

ROME

SARDINIA

Cagliari

Palermo

SICILY

Catania

Modica

Malta

Sousa

TUNIS

Odessa

Nicolaev

Azov

Sevastopol

Kertch

Livadia

Sulina

Varna

Bourgas

Sinope

Samsoun

Kilia

Batoum

Kebisano

Baku

Krasnovodsk

Astrakhan

Guriev

Koul Koudouk

Kasalinsk

CASPIAN SEA

ARAL SEA

Smyrna

Adana

Rhodes

Latakia

Rechi

Barfrouch

Moscow

Tobolsk

Tomsk

Irkutsk

RUSSIA

EUROPEAN RUSSIA

TURKEY

CHINESE EMPIRE

KARA SEA

S I B E R I A

S S I A N E M P I R E

70°

60°

50°

40°

Tobolsk

Tomsk

Irkutsk

Koul Koudouk

Kasalinsk

C H I N E S E

E M P I R E

OKHOTSK SEA

Nikolaevsk

Alexandrovsk

Alexandrovsk Rd

Petropavlovsk

C. Lopatka

KAMCHATKA

Rykouskoie

SAKHALIN I

KURIL ISLANDS

Sova

Vladivostok

Rurume

HOKUSHU

Nemuro

Iwanai

Esashi

Hakodate

Hashinohe

Kamaishi

Sendai

Akita

Sakata

Nagata

Taira

Mito

Kanazawa

SEA OF JAPAN

PEKIN

Tientsin

Newchwang

Tangku

Port Arthur

Hwangtu

Chemulpho

SOUL

Chefoo

Chinkiang

Shanghai

Ningpo

Foochow

Amoy

Swatow

Hongkong

Canton

Kiungchow

Pakhoi

Haiphong

Hanoi

Lungchow

Mengtsz

Manwyne

Bhamo

Momein

Tengyueh

Lashio

Kengtung

Muang Nan

Muang Lom Sak

Muang Phetchabun

Muang Phitsanulok

Muang Sukhothai

Muang Tak

Muang Kamphaeng Phet

Muang Nakhon Sawan

Muang Chainat

Muang Suphanburi

Muang Kanburi

Muang Ratburi

Muang Petburi

Muang Prachuap Khirikhan

Muang Chumphon

Muang Lampun

Muang Patani

Muang Singora

Muang Ligor

Muang Phatthalung

Muang Trang

Muang Phangnga

Muang Takuapa

Muang Kraburi

Muang Ranong

Muang Chaiya

Muang Nakhon Si Thammarat

Muang Phuket

Muang Krabi

Muang Phuket

S I B E R I A

ALASKA

60°

50°

40°

30°

20°

C H I N E S E

E M P I R E

OKHOTSK SEA

BERING SEA

GULF OF ANADUIR

BERING STRAIT

East C.

Kotzebue Sd.

C. Pr. of Wales

NORTON SOUND

St. Lawrence I.

Yukon R.

C. Navarin

St. Matthew I.

Nunivak I.

C. Olintorsk

Karaginski I.

C. Ozernui

C. Kamchatka

Komandorski

C. Kronotskoi

C. Shipunski

Petropavlovsk

C. Lopatka

KAMCHATKA

KURIL ISLANDS

Near Is.

Rat Is.

Andreanof Is.

ALEUTIAN ISLANDS

Umnak

Unalaska

Unimak

Kuskokwim B.

Bristol Bay

ALASKA PENIN.

COOK INLET

Pribilof Is.

KADIAK

GULF OF ALASKA

Yakutat B.

Sitka

Nikolaevsk

Alexandrovsk

Alexandrovsk Rd.

Rykovskoie

SAKHALIN I.

Soya

Ruruma

Iwanai

Esashi

Fukuyama

Aomori

Vladivostok

HOKUSHU

Nemuro

Irakawa

Hakodate

Hashinohe

Kamaishi

Sendai

Akita

Sakata

Kanazawa

Nagai

Tairo

Mito

HONSHU

TOKYO

Yokohama

Shimoda

Yokkaichi

Nagasaki

KIUSHU

Kagoshima

JAPAN

SEA OF JAPAN

KOREA

Port Arthur

Dairen

Chemulpo

WHANG HAI OR YELLOW SEA

Wusung

Shanghai

Middle I.

Chinhai

Amoy

FORMOSA

Kelung

Tamsui

Aparri

LUZON

Lingayen

Albany

HYUKYU ISLANDS

BONIN ISLES

VOLCANO ISLES

MARIANA OR LADRONE IS

N O R T H P A C I F I C O C E A N

HAWAIIAN IS

Honolulu

Hilo B.

XUM

I A

ALASKA

D O M I N I O N O F

C

HUD

East C

C. Prince of Wales

Kotzebue Sd

BERING STRAIT

GULF OF ANADUIR

NORTON SOUND

St. Lawrence I

Yukon R.

C. Navarin

St. Matthew I

Nunivak I

C. Olintorsk

Karaginski I

BERING SEA

Kuskokwim R.

Bristol Bay

C. Ozernoi

Pribilof Is

C. Kamchatka

Komandorski

C. Kronotskoi

gunski

ovsk

Near Is

ALEUTIAN ISLANDS

Rat Is

Andreanof Is

Unimak

Unalaska

Umnak

COOK INLET

ALASKA PENIN.

SHELIKOF STR.

KADIAK

GULF OF ALASKA

Yakutat B.

Sitka

QUEEN CHARLOTTE IS

Queen Charlotte Sd.

VANCOUVER I.

New Westminster

Victoria

Whatcom

Tacoma

Townsend

Seattle

Olympia

Astoria

Vancouver

Portland

Empire City

Eureka

Salt Lake City

Denver

UNITED STATES

St. Louis

Milwaukee

Chicago

Duluth

L. SUPE

Oakland

S. Francisco

San Jose

Monterey

S. Luis Obispo

Sta Barbara

Wilmington

S. Diego

Yuma

LOWER CALIFORNIA

G. of CALIFORNIA

Pichilingue

La Paz

Guaymas

MEXICO

Mazatlan

San Blas

Manzanillo

Tampico

Progreso

Vera Cruz

Campêche

Carmen

Tuxtla

Coatzacoalcos

Acapulco

Salina Cruz

GUATEMALA

S. SALVADOR

HONDURAS

Belize

New Orleans

Mobile

Galveston

Indianola

Rockport

Brownsville

Matamoras

GULF OF MEXICO

Apalachi

Pnsa

Ba

HAWAIIAN IS

Honolulu

Hilo B

PACIFIC OCEAN

XUM

DOMINION OF CANADA

HUDSON BAY

FOX LAND

SOUTHAMPTON I.

CUMBERLAND

DENMARK STRAIT

UNITED STATES

MEXICO

GULF OF MEXICO

GULF OF CALIFORNIA

LOWER CALIFORNIA

ATLANTIC OCEAN

NORTH

CARIBBEAN SEA

BERMUDA

AZORES OR WESTERN

WINDWARD OR CARIBBEAN IS

BAHAMA IS

Charlotte Sd.

Victoria
Whatcom
Tacoma
Townsend
Seattle
Olympia
Astoria
Vancouver
Portland
New Westminster
Empire City
Eureka
Salt Lake City
Denver
Oakland
S. Francisco
San Jose
Monterey
S. Luis Obispo
Sa. Barbara
Wilmington
S. Diego
Yuma
Guaymas
Pichilinque
La Paz
Mazatlan
San Blas
Manzanillo
Acapulco
Salina Cruz
Tampico
Vera Cruz
Tuspan
Progreso
Sisal
Campeche
Carmen
Frontera
Coatzacoalcos
Tuxtla
Belize
P. Cortez
Truxillo
HONDURAS
TEGUCIGALPA
NICARAGUA
GUATEMALA
S. SALVADOR
Bluefields
Greytown
Duluth
L. SUPERIOR
Milwaukee
Chicago
Detroit
Toledo
Erie
Buffalo
Cincinnati
St Louis
Pittsburg
Baltimore
WASHINGTON
Philadelphia
Wilmington
New York
New Haven
Providence
Boston
Albany
Rye Beach
Portland
Belfast
Toronto
ONTARIO
Montreal
Quebec
Tadoussac
Dalhousie
Gaspe
Anticosti
Bonne Bay
Tilt Cove
GULF OF ST LAWRENCE
NEW FOUNDLAND
Hearts Content
St Johns
Amherst
Sydney
Canso
St Pierre
Halifax
Newport News
Norfolk
Wilmington
Charleston
Savannah
Brunswick
Fernandina
St Augustine
St Marks
Pensacola
Mobile
New Orleans
Galveston
Indianola
Rockport
Brownsville
Matamoras
Cedar Keys
Tampa
Pta Rasa
Key West
Habana
Matanzas
Cardenas
Bahia Honda
Pinar del Rio
Batabano
Sagua
Caibarien
Maternillo
Jibara
Baracoa
Santiago
Cienfuegos
Haitien
P Plata
Sanchez
St Nicholas Mole
JAMAICA
Savannah la Mar
Kingston
HAITI
P AU PRINCE
S DOMINGO
Aguadilla
P Ponce
Puerto Rico
S. Juan
Sta Cruz
St Thomas
St Christopher
Guadeloupe
Anguilla
Antigua
Dominica
Martinique
St Lucia
Barbados
St Vincent
Grenada
Tobago
Trinidad
Barranquilla
Sta Marta
Laguayra
Maracaibo
Coro
Porto Cabello
Curacoa
Aruba
P Spain
Gibara
Nassau
Fayal
Terceira
St Vincent
C. VERDE IS
St

CUMBERLAND

DENMARK STRAIT

ICELAND

FÆROE IS

SHETLAND IS

ORKNEY IS

BRITISH ISLES

HEBRIDES

NORTH SEA

NORWAY

SWEDEN

GULF OF BOTHNIA

WHITE SEA

RUSSIA

DENMARK

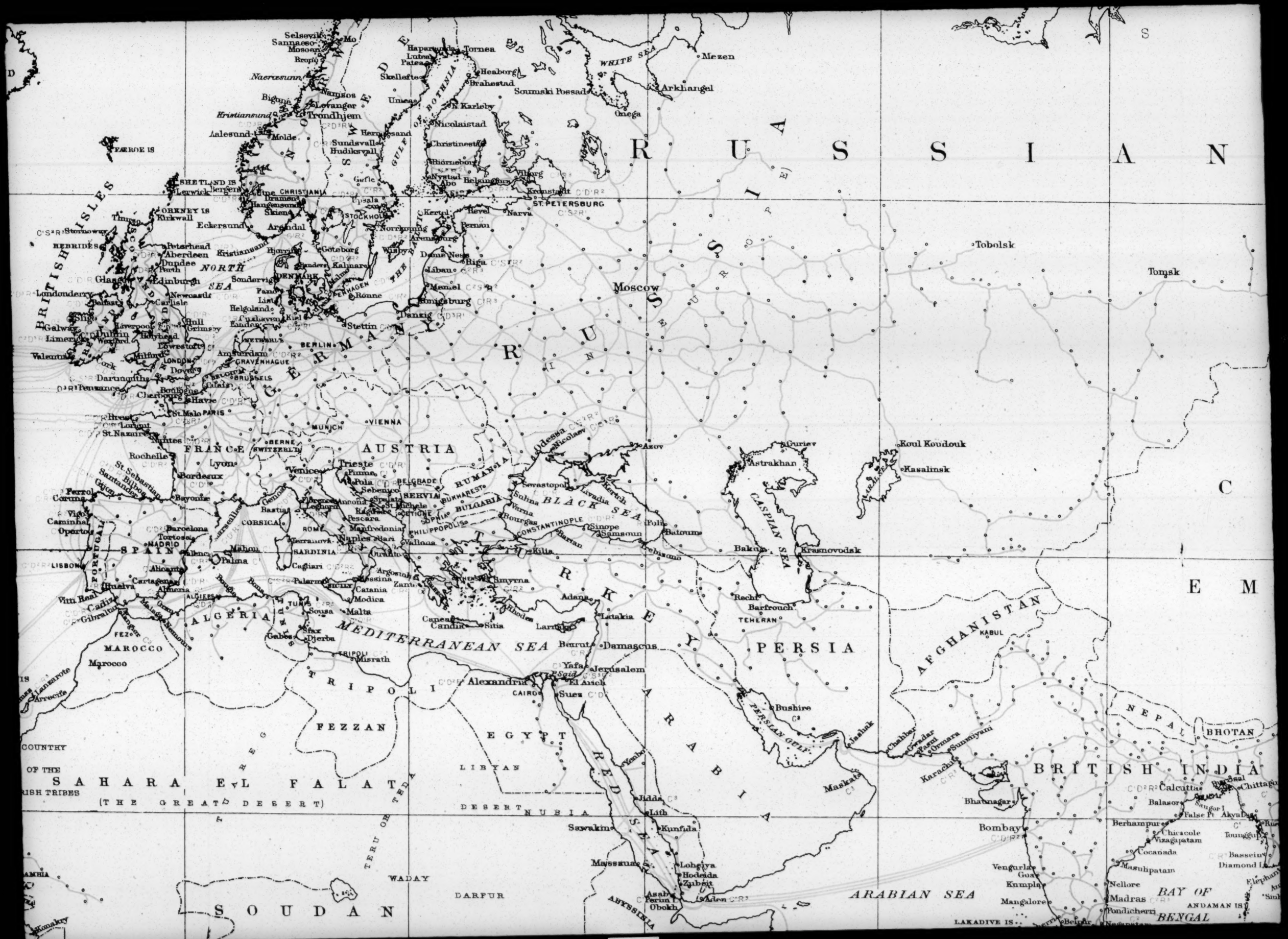
GERMANY

BERLIN

Moscow

Selsevik
Sannaeso
Mosoen
Bronö
Naeresunn
Bigone
Kristiansund
Lalesund
Molde
Namsos
Levanger
Trondhjem
Mo
Bodoe
Haparanda
Tornea
Lutea
Pateas
Skellefteo
Heaborg
Brahestad
Soumski Posade
Umeaa
N Karleby
Nicolaistad
Onega
Christinestad
Sundsvall
Hudiksvall
Herrnösand
Gefle
Gothenburg
Nystad
Abo
Helsingfors
Wiborg
Kronstadt
ST. PETERSBURG
Upsala
STOCKHOLM
Kerul
Revel
Narva
Norrkoping
Arvidsborg
Bernau
Eckersund
Arendal
Dramen
Hangesund
Skiene
CHRISTIANIA
Lerwick
Bergen
Kirkwall
Thurso
Stornoway
Peterhead
Aberdeen
Dundee
Perth
Edinburgh
Glasgow
Kristiansand
Hjorring
Göteburg
Wisby
Kalmare
Landers
Malmo
COPENHAGEN
Ronne
Dame Neese
Riga
Libau
Memel
Königsburg
Danzig
Stettin
Sondervig
Esbierg
Londonderry
Belfast
Newcastle
Carlisle
Helgoland
Cuxhaven
Kiel
Emden
Lists
Sligo
Galway
Limerick
Dublin
Waterford
Liverpool
Holyhead
Hull
Grimsby
Lowestoft
Amsterdam
GRAVENHAGUE
BELGIUM
BRUSSELS
Ostend
Calais
Dover
LONDON
Milford
Cork
Valentia
Darmouth
Penzance
Boulogne
Cherbourg
Havre
St Malo
PARIS
Brest
Lorient
St Nazaire
Nantes
FRANCE
Rochelle
Bordeaux
Lyon
BERNE
SWITZERLAND
MUNICH
VIENNA
AUSTRIA
Trieste
Venice
Fiume
Pola
Sebenico
BELGRADE
SERVIA
RUMANIA
BUKHAREST
BULGARIA
Sulina
Varna
Bourgas
CONSTANTINOPLE
Sinope
Samsoun
Sevastopol
Livadia
Kertch
Azov
Odessa
Nicolaev
BLACK SEA
TURKEY
Smyrna
Adana
Rhodes
Candia
Canea
Sitia
Larnica
Latakia
Beirut
Damascus
Yafa
Jerusalem
Said
El Arish
Alexandria
CAIRO
Suez
EGYPT
MEDITERRANEAN SEA
Genoa
Leghorn
Ancona
Spalato
St Michele
Rimini
Pescara
Manfredonia
Naples
Terranova
Bastia
CORSICA
ROME
Marseilles
Barcelona
Tortosa
MADRID
SPAIN
Palma
Mahon
Valencia
Alicante
Cartagena
Almeria
Malaga
Gibraltar
Cadiz
Huelva
Vitu Real
Oporto
Caminha
Viga
Ferrol
Coruna
Gijon
Santander
St Sebastian
Bilbao
Bayonne
PORTUGAL
LISBON
Cagliari
SARDINIA
Palermo
SICILY
Catania
Modica
Messina
Zante
Argostoli
Sousa
Malta
Tunis
Bizerta
Sfax
Djerba
Gabes
Tripoli
Misrath
ALGIERS
ALGERIA
Bona
Oran
Tangier
Mazagan
Mogador
FEZ
MAROCCO
Marocco
Madeira
Funchal
CANARY IS
Teneriffe
Palma
Ferro
Lanzerote
Arrecife
Gran Canaria
AZORES OR WESTERN IS
Fayal
Terceira
S. Miguel
BERMUDA
ATLANTIC OCEAN
NORTH
Halifax
Sydney
Cape
St Pierre
Amherst
St Johns
Hearts Content
NEW FOUNDLAND
GULF OF ST LAWRENCE
Anticosti
Bonne Bay
Tilt Cove
Caspee
Pt Rich
WINDWARD OR CARIBBEAN IS
Porto Rico
St Juan
St Thomas
Anguilla
Antigua
Dominica
Martinique
St Lucia
Barbados
Grenada
St Vincent
Guadeloupe
Sta Cruz
St Christopher
C. VERDE IS
St Vincent
P. Grande
St Jago
Praya
St Louis
C. Verde
Dakar
Bathurst
SENEGAMBIA
GAMBIA
Bissao
COUNTRY OF THE MOORISH TRIBES
SAHARA EL FALATA
(THE GREAT DESERT)
FEZZAN
TRIPOLI
REG OR TEDA
TERU OR TEDA
LIBYAN DESERT
NUBIA
Sawakim
Massauah
Jidda
WADAY
DARFUR
RED SEA

XUM


RUSSIAN EMPIRE
RUSSIA
Moscow
Tobolsk
Tomsk
Mezen
Arkhangel
Soumski Posad
Onega
WHITE SEA
Haparanda
Tornea
Lutsa
Patea
Skellafte
Umea
Nicolaistad
Christinestad
Bjornebor
Abo
Helsingfors
Viborg
Kronstadt
ST. PETERSBURG
Narva
Revel
Kertel
Pernau
Arensburg
Dunae Ness
Riga
Libau
Memel
Konigsburg
Danzig
Stettin
Kalmar
Norrkoping
Wisby
Stockholm
Upsala
Gefle
Sundsvall
Hudiksvall
Hernosand
Carlskrona
Karlsby
GULF OF BOTHNIA
BALTIC SEA
SWEDEN
NORWAY
Selsevik
Sannaesund
Mosoen
Mo
Bronto
Naaraesunn
Namsos
Levanger
Trondhjem
Bigone
Kristiansund
Aalesund
Molde
Hermansand
Christiania
Drammen
Hangesund
Skiena
Eckersund
Arendal
Gothenburg
Kristiansand
Hjorring
Aalborg
Sondervig
Fano
Ribe
Esbjerg
Helgoland
Cuxhaven
Emden
Kiel
Flensburg
Rosne
Copenhagen
DENMARK
Malmo
FAEROE IS
SHETLAND IS
Lerwick
Bergen
ORKNEY IS
Kirkwall
Thurso
Stornoway
HEBRIDES
BRITISH ISLES
Peterhead
Aberdeen
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Wexford
Holyhead
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Lowestoft
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Valentia
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Darrynaha
Penzance
Boulogne
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Cherbourg
Havre
Rochelle
Rhuel
St. Malo
PARIS
Lorient
St. Nazaire
Nantes
Bordeaux
Lyons
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MUNICH
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Trieste
Venice
Fiume
Pola
Sebenico
Spalato
Ancona
Leghorn
Genoa
Bastia
CORSICA
Marseilles
Toulon
St. Sebastian
Santander
Bilboa
Gijon
Perrol
Coruna
Vigo
Caminha
Oporto
Bayonne
Barcelona
Tortosa
MADRID
SPAIN
PORTUGAL
LISBON
Mahon
Palma
Alicante
Carthagena
Almeria
Huelva
Vitu Real
Cadiz
Gibraltar
ALGIERS
Bona
Bougie
TUNIS
Sousa
Malta
Sfax
Djerba
Gabes
Tripoli
Misrath
Palermo
Trapani
Marsala
Girgenti
Sciacca
Messina
Catania
Modica
Syracuse
Augusta
Cagliari
SARDINIA
Terranova
Naples
Gaeta
Civita Vecchia
Leghorn
Pescara
Rimini
Manfredonia
Ancona
Spalato
Ragusa
Cattaro
SERVIA
BELGRADE
BOSNIA
RUMANIA
BUKHAREST
BULGARIA
Varna
Bourgas
CONSTANTINOPLE
Gallipoli
Philippopolis
Adrianople
Enos
Smyrna
Zante
Candia
Canea
Sitia
Rhodes
Larnaka
Latakia
Adana
Beirut
Damascus
Yafa
Jerusalem
Said
Alexandria
CAIRO
El Arish
Suez
Azov
Odessa
Nicolaev
Sevastopol
Kertch
Livadia
Suhna
BLACK SEA
Curiev
Astrakhan
Koul Koudouk
Kasalinsk
CASPIAN SEA
Baku
Krasnovodsk
Derbisseno
Batoum
Polio
Samsoun
Sinope
Kilia
Rechd
Barfrouch
TEHERAN
KABUL
AFGHANISTAN
PERSIA
Bushire
PERSIAN GULF
Jask
Maskat
ARABIA
Yambo
Jidda
Lith
Kunfida
Sawakim
Massauah
Lohaya
Hodeida
Zubeit
Aden
Asab
Perim I.
Obokh
ABYSSINIA
RED SEA
ARABIAN SEA
Chahbar
Gwader
Ormara
Sunmiyani
Karachi
Bhatnagar
Bombay
Vengurla
Goa
Kumpla
Mangalore
LAKADIVE IS.
Beliapar
Pondicherri
Nellore
Madras
Masulipatam
Cocanada
Vizagapatam
Chicacole
Berhampore
Calcutta
Balasore
Sangor I.
False Pt.
Akyab
Chittago
Bassein
Diamond I.
BAY OF BENGAL
ANDAMAN IS
NEPAL
BHOTAN
BRITISH INDIA
SAHARA EL FALATA
(THE GREAT DESERT)
COUNTRY OF THE
ISH TRIBES
FEZZAN
EGYPT
LIBYAN DESERT
NUBIA
WADAY
DARFUR
SOUDAN
TERU OR TERA
REG
MEDITERRANEAN SEA
TRIPOLI
MAROCCO
FEZ
Marocco
Tangier
Mequinez
Arzila
Rabat
Mogador
Arrecife
Lanzarote
Monakky
ALGERIA
TURKEY

XIII

RUSSIAN EMPIRE

CHINESE EMPIRE

Tobolsk
Tomsk
Irkutsk
Koul Koudouk
Kasalinsk
Semovodsk
AFGHANISTAN
KABUL
NEPAL
BHOTAN
BRITISH INDIA
Jashak
Chahbar
Gwadar
Pasni
Ormara
Sunmiyani
Karachi
Maskat
Bhaunagar
Bombay
Calcutta
Balasore
Sangor I
False Pt
Akyab
Chittagong
Berhampur
Chicacole
Vizagapatam
Cocanada
Masulipatam
Vengurla
Goa
Kumpla
Mangalore
Nellore
Madras
Pondicherri
Negapatam
Jafnapatam
Trincomali
CEYLON
Batticaloa
Cochin
Quilon
Nagercoil
Bellicherri
Belpar
LAKADIVE IS
ANDAMAN IS
NICOBAR IS
ARABIAN SEA
BAY OF BENGAL
Diamond I
Elephant Pt
Amherst
Tavoy
Mergui
Sinhyoochin
BANGKOK
Kampot
St James
St Jaques
Camao
GULF OF SIAM
COCHIN CHINA
Namdinh
Haifong
Vinh
Kungchan
HAINAN
Fuchau
Amoy
Cantom
Swatau
Hongkong
Macao
Chuchau
Takau
Kelung
Anping
FORMOSA
Wanfu
Tamsui
Sakaloxes Is
CHINA SEA
Lanag
Aparri
Vigan
Bolinao
LUZON
Langayen
Yba
Manila
Albany
PHILIPPINE IS
PALAWAN
Iloilo
SULU SEA
Kudat
MINDANAO
Yap
PELEW IS
MARIANA OR LADRONE IS
BONIN ISLES
VOLCANO ISLES
RYUKYU ISLANDS
Nagasaki
Goshima
KIUSHU
JAPAN
Wusung
Shanghai
Saddle I
Chinhai
Ningpo
Chusan
Tinghai
Tientsin
PEKIN
Tangku
Taku
Chefoo
Yantai
Hwangtu
Arthur
Chemulpho
SOUL
WHANG HAI OR YELLOW SEA
KOREA
Yuensan
SEA OF JAPAN
Akita
Sakata
Kamaishi
Sendai
Kanazawa
Nagaoka
Taira
Mito
HONSHU
TOKYO
Tsuruga
Sakai
Hakodate
Hashinohe
Yokohama
Shimoda
Fukuyama
Aomori
Esashi
Iwanai
Rurumo
Vladivostok
HOKUSHU
Nemuro
Urakawa
Nuchwang
Pingyang
OKHOTSK SEA
Nikolaevsk
Alexandrovsk
Alexandrovsk Rd
Rykouskoie
SAKHALIN I
C Lopatka
Petropavlovsk
KAMCHATKA
KURIL ISLANDS
60°
50°
40°
30°
20°
10°

EMPIRE

SEA OF JAPAN

KOREA

WHANG HAI OR YELLOW SEA

JAPAN

HONSHU

YOKOHAMA

SHANGHAI

RYUKYU ISLANDS

BONIN ISLES

VOLCANO ISLES

FORMOSA

MARIANA OR LADRONE IS

PHILIPPINE IS

LUZON

MINDANAO

CELEBES SEA

CAROLINE ISLANDS

PELEW IS

Yap

MARSHALL IS

GILBERT IS

Admiralty Is

PAPUA OR NEW GUINEA

ARAFURA SEA

TIMOR

Timor Laut

SOLOMON IS

NEW MECKLENBURG

BOUGAINVILLE

Treasury I

TORRES STRAIT

Thursday I

C York

GULF OF CARPENTARIA

CORAL SEA

AUSTRALIA

PHOENIX IS

UNION IS

STA CRUZ IS

FIJI IS

NEW HEBRIDES

LOYALTY IS

NEW CALEDONIA

Noumea

PHIENDIY IS

SAMOAN IS

Apia

Pago Pago

HAWAIIAN IS

Honolulu

Hilo B

Fanning I

SOCIETY IS

Tahiti

HERVEY OR COOK IS

Tubuai or Austral Is

TUAMOTU

NORTH PACIFIC OCEAN

Vladivostok

Nemuro

Hakodate

Hashinohe

Kamaishi

Sendai

Yokohama

Nagasaki

Shanghai

Wusung

Amoy

Swatow

Hongkong

Kelung

Aparri

Albany Is

Davao

Gilolo

Amboina

Ceram

Dobbo

Arru Is

Kupang

Darwin

Palmerston

Yam Cr

Katherine

Derby

Broome

Burketown

Normanton

Cairns

Cardwell

Townsville

Bowen

Bloomsbury

Mackay

St Lawrence

Mattaburra

Alice Springs

Rockhampton

Gladstone

Sandy C

Maryborough

Gympie

Brisbane

Charleville

Cooktown

Thursday I

Moreton

Burketown

Normanton

Admiralty Is

Mecho Hbr

Blanche B

Gulf Papua

Torres Strait

Coen

C Melville

Mitchell R

Albert R

Flinders R

Roper R

Victoria R

Ord R

Fitzroy R

Burdekin R

Barcoo R

Diamantina R

Georgina R

Macdonnell Ranges

Musgrave Ranges

Barkly Tableland

Gulf of Carpentaria

Arafura Sea

Timor Sea

Coral Sea

Great Sandy Desert

Gibson Desert

Great Victoria Desert

Great Australian Bight

Nullarbor Plain

Simpson Desert

Sturt Stony Desert

Tasman Sea

Lake Eyre

Lake Torrens

Lake Gairdner

Lake Frome

Lake Callabonna

Lake Amadeus

Lake Mackay

Lake Macdonald

Lake Nash

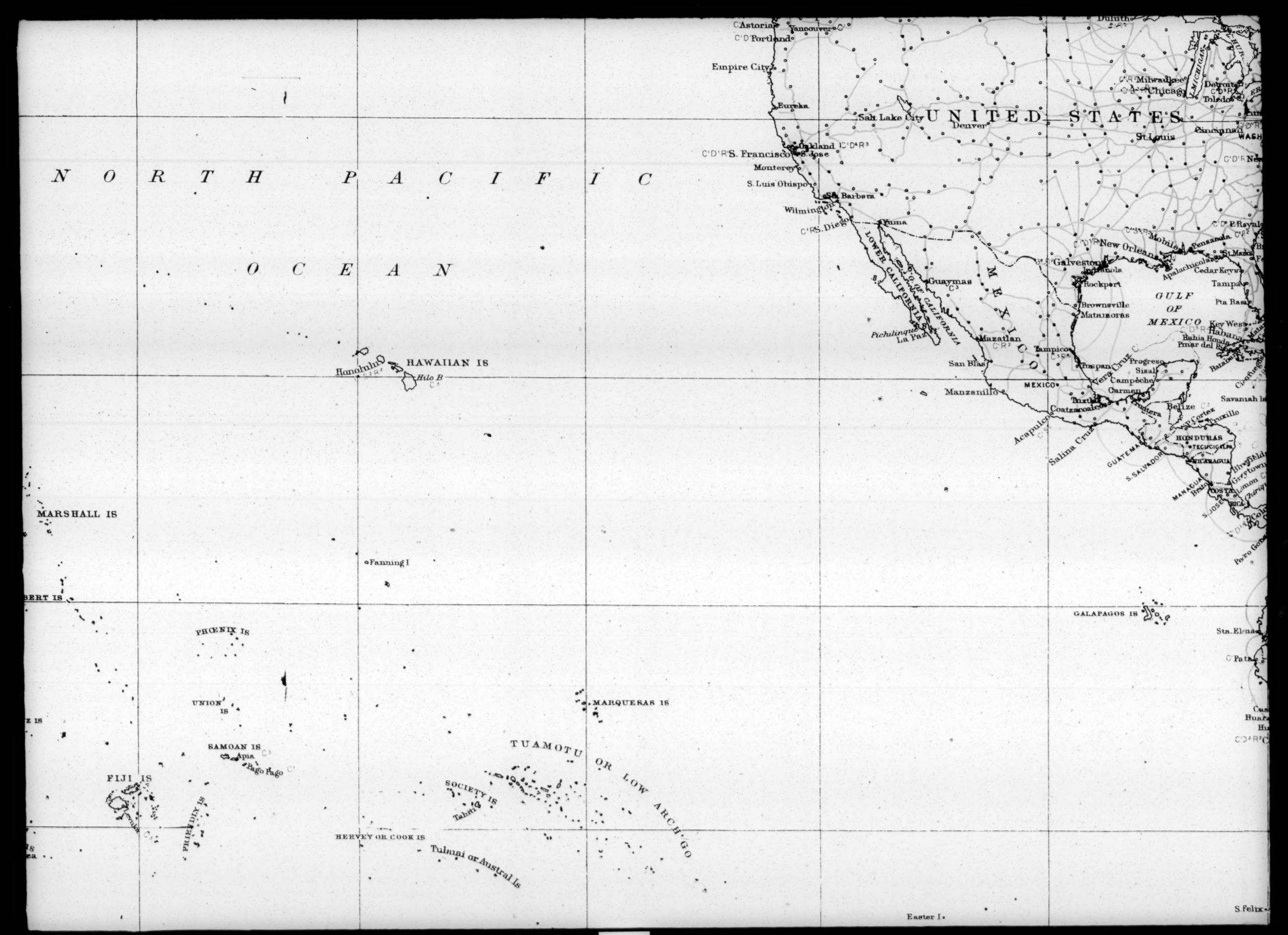
Lake Buchanan

Lake Nash

Lake Mackay

Lake Amadeus

Lake Macdonald


NORTH PACIFIC OCEAN
UNITED STATES
MEXICO
GULF OF MEXICO
C. of CALIFORNIA
LOWER CALIFORNIA
Astoria
Vancouver
Portland
Empire City
Eureka
Salt Lake City
Denver
Oakland
S. Francisco
San Jose
Monterey
S. Luis Obispo
Santa Barbara
Wilmington
San Diego
Yuma
Guaymas
Pichilingue
La Paz
Mazatlan
San Blas
Manzanillo
Tampico
Tuspan
Vera Cruz
Progreso
Sisal
Campêche
Carmen
Tuxtla
Coatzacoalcos
Acapulco
Salina Cruz
Belize
P. Cortez
Truxillo
HONDURAS
GUATEMALA
S. SALVADOR
NICARAGUA
COSTA RICA
Bluefields
Greytown
Limon
Panama
Pto Gonzo
Galveston
New Orleans
Mobile
Pensacola
St Marks
Apalachicola
Cedar Keys
Tampa
Pta Rasa
Rockport
Brownsville
Matamoras
Key West
Habana
Bahia Honda
Pinar del Rio
Batabano
Savanah la
Milwaukee
Chicago
Detroit
Toledo
Cincinnati
St Louis
Duluth
MICHIGAN
HURON
WASH
Hawaiian Is
Honolulu
Hilo B
Marshall Is
Fanning I
Gilbert Is
Phœnix Is
Union Is
Samoan Is
Apia
Pago Pago
Fiji Is
Friendly Is
Marquesas Is
Tuamotu or Low Archipelago
Society Is
Tahiti
Hervey or Cook Is
Tubuai or Austral Is
Galapagos Is
Sta. Elena
Easter I.
S. Felix

UNITED STATES
MEXICO
GULF OF MEXICO
CARIBBEAN SEA
NORTH ATLANTIC OCEAN
BERMUDA
AZORES OR WESTERN IS
WINDWARD OR CARIBBEAN IS
GALAPAGOS IS
COLOMBIA
VENEZUELA
ECUADOR
PERU
BOLIVIA
BRAZIL
BRITISH GUIANA
DUTCH GUIANA
FRENCH GUIANA
HAITI
JAMAICA
HONDURAS
NICARAGUA
COSTA RICA
GUATEMALA
S. SALVADOR
BAHAMA IS
C. VERDE IS
LOWER CALIFORNIA
GULF OF CALIFORNIA
L. SUPERIOR
L. MICHIGAN
L. HURON
L. ERIE
L. ONTARIO
GULF OF ST LAWRENCE
NEW FOUNDLAND
WASHINGTON
MONTEVIDEO
RIO DE JANEIRO
Victoria
New Westminster
Whatcom
Tacoma
Seattle
Townsend
Olympia
Astoria
Portland
Vancouver
Eureka
Salt Lake City
Denver
Oakland
S. Francisco
San Jose
Monterey
S. Luis Obispo
Santa Barbara
Wilmington
S. Diego
Yuma
Duluth
Milwaukee
Chicago
Detroit
Toledo
Erie
Pittsburg
Cincinnati
St Louis
Toronto
Montreal
Quebec
Tadousac
Laspee
Dalhousie
Amherst
Sydney
Cape
Halifax
Belfast
Portland
Albany
Rye Beach
Boston
Durham
New Haven
New York
Philadelphia
Wilmington
Baltimore
Newport News
Norfolk
Wilmington
Charleston
Savannah
Brunswick
Fernandina
St. Augustine
Cedar Keys
Tampa
Pta Rasa
Key West
Havana
Bahia Honda
Pinar del Rio
Matanzas
Cardenas
Nassau
Sagua
Caibarien
Maternillo
Jibara
Baracoa
Haitien
P Plata
Sanchez
Santiago
St Nicholas Mole
Savanna la Mar
Kingston
P. au Prince
S. Domingo
Aguadilla
P Ponce
Puerto Rico
S Juan
Sta Cruz
St Christopher
Guadeloupe
St Thomas
Anguilla
Antigua
Dominica
Martinique
St Lucia
Barbados
St Vincent
Grenada
Trinidad
S Fernando
Caracas
Caballo
Laguayra
Puerto Cabello
Coro
Maracaibo
Sta Marta
Baranquilla
Cartagena
Panama
Colon
Porto Bello
Pedro Gonzales I.
Bluefields
Greytown
Limon
Truxillo
Belize
Progreso
Sisal
Campeche
Carmen
Frontera
Vera Cruz
Tuxtla
Coatzacoalcos
Tampico
Prospan
Mazatlan
Manzanillo
Acapulco
Salina Cruz
San Blas
Guaymas
Pichilinque
La Paz
Rockport
Galveston
Indianola
New Orleans
Mobile
Pensacola
Apalachicola
St Marks
Brownsville
Matamoras
Georgetown
Berbice
Paramaribo
Simanari
Cayenne
Bogota
Buenaventura
Quito
Guayaquil
Sta Elena
Paita
Casma
Huaraney
Huacho
Callao
Lima
Canete R.
Pisco
Cachenta
Ilay
Mollendo
Arica
Pisagua
Sucre
Iquique
Tocopilla
Cobija
Antofagasta
Para
Vesen
Maranhao
Ceara
Amacati
Fernando Noronha
Natal
Parahiba
Pernambuco
Maceio
Aracaju
Timbo
Bahia
Valenca
Camamu
Ilheos
Belmonte
P. Seguro
Caravellas
San Mateo
Victoria
Trinidad
Imperatriz
S. Joao do Barra
Macahe
C. Frio
Rio de Janeiro
Iguape
Paratiba
Madeira
Palma
Gran Ca
St. Paul
St. Vincent
P. Grande
St. Jago
P. Praya
Bathu

NORTH ATLANTIC OCEAN

SOUTH ATLANTIC OCEAN

Gulf of St. Lawrence · Newfoundland · Hearts Content · St. Johns · Caspe · Dalhousie · Amherst · Sydney · Cape · Belfast · Halifax · Boston · St. Pierre

Azores or Western Is · Fayal · Terceira · S. Miguel

Bermuda

Madeira · Funchal · Canary Is · Tenariffe · Palma · Gran Canaria · Palmas · Lanzerote · Arrecife

Cape Verde Is · St. Vincent · P. Grande · St. Jago · Praya

Haiti · Hayti · Plata · Sanchez · Puerto Rico · St. Thomas · Anguilla · Antigua · Sta. Cruz · St. Christopher · Dominica · Guadeloupe · Martinique · St. Lucia · St. Vincent · Barbados · Grenada · Trinidad · Laguayra · Porto Cabello · Caracas · Barcelona · Cumana · Guiria · Rio Chico · Pto. Cabello · Spain · St. Fernando · Venezuela · Bogota

Georgetown · Berbice · Paramaribo · Sinamari · Cayenne · British · Dutch · French · Guiana · Amazon R. · Para · Maranhão · Ceara · Aracaty · Fernando Noronha · Natal · Parahiba · Pernambuco · Maceio · Aracaju · Timbo · Bahia · Valenca · Caimamu · Ilheos · Belmonte · P. Seguro · Caravellas · Sn. Matheo · Victoria · Ilhapemirim · S. Joao do Barra · Macahe · C. Frio · Rio de Janeiro · Trinidad · Brazil · Bolivia · Sucre · Pitagua · Cohija · Paraguay · Iguana

St. Paul · Ascension I · St. Helena

Cherbourg · Havre · Brest · St. Malo · Paris · Lorient · St. Nazaire · Nantes · France · Rochelle · Lyons · Bordeaux · St. Sebastian · Bilbao · Santander · Gijon · Ferrol · Coruna · Bayonne · Vigo · Caminha · Oporto · Portugal · Barcelona · Tortosa · Madrid · Spain · Lisbon · Palma · Mahon · Alicante · Cartagena · Almeria · Huelva · Vitti Real · Cadiz · Gibraltar · Algiers · Bona · Tunis · Sousa · Malta · Algeria · Mediterranean Sea · Fez · Morocco · Marocco · Tripoli · Misrath · Gabes · Sfax · Djerba · Corsica · Bastia · Rome · Terranova · Sardinia · Cagliari · Palermo · Sicily · Messina · Catania · Modica · Zante · Munich · Vienna · Berne · Switzerland · Austria · Trieste · Venice · Fiume · Pola · Sebenico · Belgrade · Rumania · Bucharest · Servia · Spalato · St. Michele · Ancona · Pescara · Manfredonia · Naples · Gaeta · Ischia · Leghorn · Piombino · Genoa · Marseilles · Bulgaria · Sophia · Philippopolis · Varna · Bourgas · Constantinople · Sinope · Barian · Rilla · Turkey · Smyrna · Adana · Rhodes · Candia · Canea · Sitia · Latta · Larnaka · Beirut · Yafa · Jerusalem · Alexandria · El Arish · Cairo · Suez · Egypt · Libyan Desert · Nubia · Sawakim · Massaua · Waday · Darfur · Soudan · Fezzan · Tripoli · Country of the Moorish Tribes · Sahara El Falata · (The Great Desert) · Tegharry · Terra

Sierra Leone · Liberia · Guinea · Ashanti · Fogo · Dahomey · Lagos · Benin · Bonny · Grand Bassam · Elmina · Cape Coast Castle · Accra · Kamerun · Fernando Po · Princes I · St. Thomas · C. Lopez · Gabun R. · Libreville · French Kongo · Kongo State · Kongo R. · Loanda · Angola · Benguela · Mossamedes · C. Frio · Matabele Land · Damara Land · Walfisch B. · Gara Land · Mozambique

Yum

FRANCE
AUSTRIA
SPAIN
PORTUGAL
ALGERIA
MOROCCO
TUNIS
TRIPOLI
FEZZAN
EGYPT
LIBYAN DESERT
NUBIA
ARABIA
PERSIA
TURKEY
BLACK SEA
CASPIAN SEA
MEDITERRANEAN SEA
RED SEA
PERSIAN GULF
ARABIAN SEA
BAY OF BENGAL
INDIAN OCEAN
AFGHANISTAN
BRITISH INDIA
NEPAL
BHOTAN
SOUDAN
WADAY
DARFUR
ABYSSINIA
SOMALI
KAMERUN
FRENCH KONGO
KONGO STATE
ANGOLA
MOZAMBIQUE
MADAGASCAR
MATABELE LAND
DAMARA LAND
GARA LAND
KALAHARI
CORSICA
SARDINIA
SICILY
CRETE
RHODES
CYPRUS
MALTA
ZANZIBAR
SEYCHELLE IS
CHAGOS ARCH'GO
LAKADIVE IS
MALDIVE IS
CEYLON
NICOBAR IS
ANDAMAN IS
REUNION
MAURITIUS I
ST. HELENA
ASHANTI
TOGO
DAHOMEY
ST. MALO
PARIS
BREST
LORIENT
ST. NAZAIRE
NANTES
ROCHELLE
BORDEAUX
BAYONNE
ST. SEBASTIAN
BILBOA
SANTANDER
CORUNNA
LYON
MARSEILLES
VIENNA
MUNICH
BERNE
SWITZERLAND
TRIESTE
VENICE
FIUME
POLA
SEBENICO
BELGRADE
SERVIA
BUKHAREST
RUMANIA
SOPHIA
BULGARIA
PHILIPPOPOLIS
CONSTANTINOPLE
ODESSA
NICOLAIEV
AZOV
SEVASTOPOL
SUDJA
VARNA
BOURGAS
KERTCH
LIVADIA
SINOPE
SAMSOUN
POTI
BATOUM
KOUL KOUDOUK
KASALINSK
ASTRAKHAN
GURIEV
BAKU
KRASNOVODSK
RECHT
BARFROUCH
TEHERAN
KABUL
ANCONA
SPALATO
ST. MICHELE
PESCARA
MANFREDONIA
BARI
NAPLES
TERRANOVA
LEGHORN
GENOA
BASTIA
ROME
VALLONA
DURAZZO
RIZA
SMYRNA
ADANA
LATAKIA
BEIRUT
DAMASCUS
JERUSALEM
YAFA
ALEXANDRIA
CAIRO
SUEZ
EL ARICH
PORT SAID
LARNACA
CANEA
CANDIA
SITIA
BENGHAZI
DERNA
TOBRUK
SOLLUM
SIWA
MISRATH
GADAMES
GHADAMES
SFAX
DJERBA
SOUSA
TUNIS
BIZERTA
BONE
PHILIPPEVILLE
ALGIERS
ORAN
MELILLA
TETUAN
TANGIER
FEZ
MARROCO
MOGADOR
MAZAGAN
SAFFI
MOGADOR
CADIZ
GIBRALTAR
HUELVA
CARTAGENA
ALMERIA
MALAGA
ALICANTE
VALENCIA
TORTOSA
BARCELONA
MADRID
MAHON
PALMA
CAGLIARI
PALERMO
MESSINA
CATANIA
MODICA
ZANTE
CANEA
CANDIA
SITIA
RHODES
LARNACA
LATAKIA
ADANA
SMYRNA
BEIRUT
DAMASCUS
JERUSALEM
YAFA
ALEXANDRIA
CAIRO
SUEZ
EL ARICH
PORT SAID
BUSHIRE
JASHAK
CHAHBAR
GWADAR
PASNI
ORMARA
SUMMIYANI
KARACHI
MASKAT
JIDDA
LITH
KUNFUDA
SAWAKIN
MASSAUA
HODEIDA
LOHEIYA
ZUBEIT
ASAB
PERIM
OBOKH
ADEN
MOCHA
KAMARAN
KAMPLA
VENGURLA
GOA
MANGALORE
BOMBAY
BHAVNAGAR
COCHIN
QUILON
NAGERCOIL
COMORIN C.
PONDICHERRY
MADRAS
NEGAPATAM
NELLORE
MASULIPATAM
COCANADA
VIZAGAPATAM
CHICACOLE
BERHAMPUR
JAFNAPATAM
TRINCOMALI
BATTICALOA
CALCUTTA
BALASOR
SAUGOR I.
FALSE PT.
AKYAB
CHITTAGONG
DIAMOND I.
BASSEIN
TOUNGOUP
MOULMEIN
ELEPHANT PT.
ANDAMAN I.
SIBUYOOCHI
NICOBAR IS
ACHEEN HD.
PENANG
MEDANA
SINGAPORE
TAPANULI
BENKULEN
COMORO
MAYOTTA
DIEGO SUAREZ
NOSSI BE I.
ST. MARY I.
ANTANANARIVO
MAURITIUS I.
PT. LOUIS
MAHEBOURG
REUNION
SEYCHELLE IS
MAHE
CHAGOS ARCH'GO
DIEGO GARCIA
LAKADIVE IS
MALDIVE IS
CEYLON
NICOBAR IS
ANDAMAN IS
ST. HELENA
LOANDA
BENGUELA
MOSSAMEDES
C. FRIO
WALFISCH B.
C. LOPEZ
ST. THOMAS
PRINCES I.
FERNANDO PO
GABUN R.
LIBREVILLE
KONGO R.
CAPE COAST CASTLE
ELMINA
GRAND BASSAM
ACCRA
LAGOS
PORTO NOVO
BONNY
P. FRANCO
ABO
CHINA

CHINESE EMPIRE

AFGHANISTAN

KABUL

NEPAL

BHOTAN

BRITISH INDIA

ARABIAN SEA

BAY OF BENGAL

ANDAMAN IS

NICOBAR IS

LAKADIVE IS

MALDIVE IS

CHAGOS ARCH'GO

Diego Garcia

INDIAN OCEAN

CHINA SEA

SEA OF JAPAN

YELLOW SEA

KOREA

JAPAN

HONSHU

KYUSHU

SHIKOKU

HOKKAIDO

RYUKYU ISLANDS

BONIN ISLES

VOLCANO ISLES

MARIANA OR LADRONE IS

CAROLINE ISLANDS

PHILIPPINE IS

LUZON

MINDANAO

PALAWAN

SULU SEA

CELEBES SEA

JAVA SEA

ARAFURA SEA

TIMOR

BORNEO

SUMATRA

JAVA

PAPUA OR NEW GUINEA

TORRES STRAIT

CORAL SEA

GULF OF CARPENTARIA

AUSTRALIA

Kasalinsk

Sova

Rurumee

Vladivostok

Iwanai

HOKUSHU

Nemuro

Urakawa

Esashi

Hakodate

Fukuyama

Aomori

Hashinohe

Kamaishi

Akita

Sakata

Sendai

Nagata

Kanazawa

Taira

Mito

Tsuruga

Sakai

Yokohama

Shimoda

Akamagaseki

Tokushima

Kochi

Nagasaki

Goshima

Niuchwang

Pingyang

Yuensan

Tengku

Arthur

Hwangtu

Chemulpo

SOUL

Chinnampo

Chefoo

Tientsin

PEKIN

Wusung

Shanghai

Saddle I

Chinhai

Fuchau

Amoy

Pescadores Is

Yamami

Kelung

Amping

FORMOSA

Takau

Swatau

Canton

Hongkong

Macao

Bakhoi

Fuchau

Kungchau

Namduhoa

Haifong

Vinh

HAINAN

Quangnam

Quanghai

Quinhon

Honcohe

Tanrang B

Saigon

St. James

St. Jaques

Chinao

Kampot

BANGKOK

Sinhyoochin

Tavoy

Mergui

Moulmein

Amherst

Elephant P

Diamond I

Bassein

Cocanada

Masulipatam

Nellore

Madras

Pondicherri

Negapatam

Belpar

Jafnapatam

Trincomali

CEYLON

Batticaloa

Cochin

Quilon

Nagercoil

C Comorin

G of Manar

Colombo

Pt de Galle

Vengurla

Goa

Kumpta

Mangalore

Bombay

Bhaunagar

Karachi

Chahbar

Gwadar

Pasni

Ormara

Sunmiyani

Calcutta

Balasor

Saugor I

False Pt

Akyab

Chittagong

Berhampur

Chicacole

Vizagapatam

Tounggup

Rue

Acheen Hd

Pemanak

Medang

Singkel

Tapanuli

Malacca

Singapore

Penang

Benkalis

Jambi

Tadang

Indragiri

Benkulen

Telok Betung

Anjer

Batavia

Samarang

Sarabaya

Banjuwangi

Bali

Lombok

Sumbawa

Sandalwood I

Flores

Timor

Kupang

Sadong

Sarawak

Pontianak

Banjermassin

Mukassar

Buton I

Celebes

Gorontalo

Ternate

Gillolo

Ceram

Amboina

Gisser I

Dobbo

Aru Is

Timor Laut

Admiralty Is

New Mecklenburg

Mecko Hbr

Blanche B

Bougainville

New Pomeras Is

Treasury I

Gulf of Papua

Thursday I

C York

Moreton

Cape Melville

Cooktown

Cairns

Cardwell

Townsville

Bowen

Bloomsbury

Mackay

St Lawrence

Rockhampton

Gladstone

Sandy C

Maryborough

Gympie

Brisbane

Newcastle

Sydney

Port Jackson

Port Stephens

Jervis Bay

Twofold Bay

Port Phillip

Melbourne

Portland

Adelaide

Port Lincoln

Streaky Bay

Fowlers Bay

Eucla

Albany

Esperance B

Roebourne

N.W. Cape

Broome

Derby

Yam Cr

Katherine

Palmerston

P Darwin

Alice Springs

Mattalurra

Charleville

Burketowne

Kimberly

Loaita I

Spratly I

Amphitrite Gr

Lanag

Aparri

Vigan

Bolinao

Langayen

Manila

Yap

Pelew Is

Albany

Isabela

G of Davao

Labuan

Brunei

Kudat

Sandakan

Rwandang

Tawi Tawi

Jolo

Ilo Ilo

Yba

Quelpart I

Port Hamilton

Tsushima

Iki

Hirado

Goto Is

Fusan

Gensan

Wonsan

Chemulpo

Chinnampo

Chefoo

Tientsin

Pekin

Niuchwang

Pingyang

Arthur

Hwangtu

Tengku

Chinhai

Saddle I

Wusung

Shanghai

Swatau

Canton

Hongkong

Macao

Bakhoi

Fuchau

Amoy

Kelung

Amping

Takau

Swanfu

Yamami

Pescadores Is

Namduhoa

Haifong

Vinh

Kungchau

Quangnam

Quanghai

Quinhon

Honcohe

Tanrang B

Saigon

St. James

St. Jaques

Chinao

Kampot

Bangkok

Sinhyoochin

Tavoy

Mergui

Moulmein

Amherst

Elephant P

Diamond I

Bassein

Cocanada

Masulipatam

Nellore

Madras

Pondicherri

Negapatam

Belpar

Jafnapatam

Trincomali

Batticaloa

Cochin

Quilon

Nagercoil

C Comorin

LUZON
Lingayen
Manila
Albany
PHILIPPINE IS
Davao
MINDANAO
Yap
PELEW IS
LADRONE IS
CAROLINE ISLANDS
MARSHALL IS
Fanning I
Celebes
SEA
Kema
GILLOLO
Ternate
GILBERT IS
Admiralty Is
NEW MECKLENBURG
Mecho Hbr
Blanche B
BOUGAINVILLE
SOLOMON IS
PHOENIX IS
Amboina
CERAM
Gasser Is
Dobbo
Arru Is
PAPUA
OR
NEW GUINEA
Timor Laut
ARAFURA
SEA
Treasury Is
UNION
IS
TIMOR
Kupang
Gulf
Papua
Thursday I
C York
TORRES STRAIT
TUAMOTU
P Darwin
Palmerston
Yam Cr
Katherine
Moreton
Roeburne
C Melville
Cooktown
GULF OF
CARPENTARIA
CORAL SEA
NEW HEBRIDES
FIJI IS
STA CRUZ IS
SAMOAN IS
Apia
Pago Pago
SOCIETY IS
Tahiti
Derby
Broome
Burketown
Normanby
Cairns
Cardwell
Townsville
Bowen
Bloomsbury
Mackay
St Lawrence
Rainbow
LOYALTY IS
Noumea
NEW CALEDONIA
FRIENDLY IS
HERVEY OR COOK IS
Tubuai or Austral Is
Alice Springs
AUSTRALIA
Rockhampton
Gladstone
Sandy C
Maryborough
Gympie
Brisbane
Heads
Grafton
Kempsey
P Macquarie
Charleville
Newcastle
Sydney
Kiama
Moruya
Edan
Gabo I
Melbourne
Bass
Strait
Port Albert
Port Welson
Wilsons Prom
Western Port
Portland
Robe
Mt Gambier
Adelaide
Wellington
Wallaroo
Walsfield
Augusta
Wilson
Cowell
Streaky B
Ellistun
Pt Lincoln
C Borda
Fowler Bay
Eyre
Israelite B
Esperance B
Bruola Hbr
Warrnambool
C Otway
Macquarie Hbr
Oyster B
New Heads
TASMANIA
Hobart
KERMADEC IS
CHATHAM IS
NEW ZEALAND
Mongonui
P Russell
Whangarei
Hokianga
Auckland
Warkworth
Tokota
Grahamstown
Maketu Cove
Opotiki
Gisborne
NORTH I
P Napier
N Plymouth
Wanganui
Wellington
Otaki
Collingwood
Nelson
Westport
Charleston
Greymouth
Hokitika
Blenheim
Kaikoura
Smithfield
Christchurch
Akaroa Hbr
SOUTH I
Ashburton
Timaru
Oamaru
Palmerston
Dunedin
Balaclutha
Riverton
Bluff Hbr
Invercargill
SOUTH
O
10°
0°
10°
20°
30°
40°
50°

EXPLA

COALING	FACILITIES	C¹ Represents
		C² "
		C³ "
DOCKING	FACILITIES	D¹ Represents
		D² "
		D³ "
		D⁴ "
		S¹ "
		S² "

LL IS

Fanning I

PHOENIX IS

UNION IS

SAMOAN IS

Apia

Pago Pago

FIJI IS

FRIENDLY IS

MARQUESAS IS

TUAMOTU OR LOW ARCH'GO

SOCIETY IS

Tahiti

HERVEY OR COOK IS

Tubuai or Austral Is

KERMADEC IS

CHATHAM IS

Russell
Whangarei
Auckland
Tokota
Grahamstown
Maketu Cove
Opotiki
Gisborne
NORTH I.
New Plymouth
Wanganui
Otaki

Acapulco
Salina Cruz
GUATEMALA
S. SALVADOR
HONDURAS
TEGUCIGALPA
NICARAGUA
MANAGUA
Bluefields
Greytown
COSTA RICA
S. JOSE
Limon
Chiriqui
Colon
Panama
Puerto Gonzales
Sta. Marta
Barranquilla
Cartagena
CARIB
Bilenas
QUITO
GALAPAGOS IS
Guayaquil
Sta. Elena
ECUA
Pa[illegible]
Casma
Huaraney
Huacho
PE
LIMA
Callao
Pisco
Cachent
Easter I.
S. Felix
Juan Fernandez
Valp
La Constit
Concepc
Valdiv
Ancu

S O U T H P A C I F I C O C E A N

EXPLANATION OF SYMBOLS

COALING FACILITIES	C^1	Represents a	1st	class	coaling	station	where 1000 tons or more can be procured.	
	C^2	"	2d	"	"	"	"	500 to 1000 tons " "
	C^3	"	3d	"	"	"	"	100 " 500 " " "
DOCKING FACILITIES	D^1	Represents a	1st	class	dock	for	vessels	340′ x 60′ x 21′ or larger.
	D^2	"	2d	"	"	"	"	270′ x 50′ x 18′ " "
	D^3	"	3d	"	"	"	"	250′ x 40′ x 15′ " "
	D^4	"	4th	"	"	"	"	150′ x 30′ x 12′ " "
	S^1	"	1st	"	slip	"	"	of 2000 tons or more.
	S^2	"	2d	"	"	"	"	" 1000 to 2000 tons.
	S^3	"	3d	"	"	"	"	" 500 to 1000 "

XUM

CARIBBEAN SEA

Acapulco
Salina Cruz
GUATEMALA
HONDURAS
Tecuciglpa
NICARAGUA
S. SALVADOR
Bluefields
Greytown
Limon
COSTA RICA
S. JOSE
Puerto Limon
Panama
Colon
Pedro Gonzales I.
Kingston
Port Royal
Sta. Marta
Baranquilla
Cartagena
Maracaibo
Cabello
CARACAS
La Guayra
Barcelona
Cumana
Guanoco
Trinidad
Pernando
St. Christopher
Guadeloupe
Antigua
Dominica
Martinique
St. Lucia
Barbados
St. Vincent
Grenada
BRITISH WEST INDIAN IS
VENEZUELA
COLOMBIA
BOGOTA
Buenaventura
Georgetown
Berbice
Paramaribo
Sinamari
Cayenne
BRITISH GUIANA
DUTCH GUIANA
FRENCH GUIANA
AMAZON R.
GALAPAGOS IS
QUITO
Guayaquil
Sta. Elena
ECUADOR
Paita
Para
Maranhao
Ceara
Natal
Parahiba
Pernambuco
Maceio
Aracaju
Bahia
Ilheos
Valenca
Camamu
Behaonte
P. Seguro
Caravellas
Sn. Mateo
Victoria
Ilhapamirim
S. Joao do Barra
Trimdad
Macahe
Cabo Frio
RIO DE JANEIRO
Paratiy
Iguape
Santos
Paranagua
Sta. Catherina I.
Laguna
Torres
Conceicão do Arroio
Alegre
R. Grande do Sul
St. Paul
Fernando Noronha
Ascension I.
St. Vincent
C. VERDE IS
St. Jago
Praya
St. Louis
C. Verde
Dakar
SENEGAMBIA
GAMBIA
Bathurst
Bissao
GUINEA
Konakry
Sierra Leone
LIBER
Tristan d
Juan Fernandez
Easter I.
S. Felix
Casma
Huarmey
Huacho
LIMA
Callao
Canete R.
Pisco
PERU
Cachental
Ilay
Mollendo
Arica
Pisagua
SUCRE
BOLIVIA
Iquique
Tocopilla
Cohija
Antofagasta
Tatal
Chañaral
Caldera
Carrizal
Guasco
La Serena
Valparaiso
SANTIAGO
La Constitution
Concepcion
Arauco
Lebu
Imperial
Tolten
Valdivia
Rio Montt
Ancud
CHILE
PARAGUAY
ASUNCION
URUGUAY
Uruguay R.
BUENOS AIRES
La Plata
MONTEVIDEO
Maldonado
Lavalle
Mar del Plata
Necochea
Mercedes
Bahia Blanca
Strena
Rio Negro
ARGENTINA
FALKLAND IS
P. Stanley
C. Virgins
MAGELLAN ST
Sandy Pt.

PACIFIC OCEAN
ATLANTIC OCEAN
SOUTH

OLS

000 tons or more can be procured.
500 to 1000 tons " "
100 " 500 " " "

60' x 21' or larger.
50' x 18' " "
40' x 15' " "
30' x 12' " "
00 tons or more.
00 to 2000 tons.
0 to 1000 "

YUM

Anguilla
Antigua
Dominica
Martinique
St Lucia
Barbados
Grenada
Trinidad
S Fernando
CARIBBEAN IS
Georgetown
Berbice
Paramaribo
Sinamari
Cayenne
BRITISH
DUTCH
FRENCH
GUIANA
AMAZON R
Para
Maranhão
Ceara
Aracati
Fernando Noronha
Natal
Parahiba
Pernambuco
Maceio
Aracaju
Timbo
Bahia
Valença
Camamu
Ilheos
Belmonte
P. Seguro
Caravellas
Sn. Mateo
Victoria
Espirito Santo
Trinidad
S. João do Barra
Macahe
C. Frio
RIO DE JANEIRO
Parati
Iguape
Santos
Paranagua
Sta. Catherina I
Laguna
Torres
Conceição do Arroio
Legre
R. Grande do Sul
PARAGUAY
ASUNCION
URUGUAY
Uruguay R.
Maldonado
MONTEVIDEO
La Plata
Lavalle
Mar del Plata
Necochea
Strena
Bahia Blanca
Rio Negro
BRAZIL
ARGENTINA
FALKLAND IS
P. Stanley
St. Vincent
P. Grande
C. VERDE IS
St. Jago
Praya
St. Louis
C. Verde
Dakar
Bathurst
SENEGAMBIA
GAMBIA
Bissao
GUINEA
Konakry
Sierra Leone
LIBERIA
GUINEA
Grand Bassam
ASHANTI
Elmina
Cape Coast Castle
Akra
TOGO
DAHOMEY
P. Novo
Lagos
Brass
Bonny
KAMERUN
Fernando Po
Princes I
St. Thomas
Gabun R.
Libreville
C. Lopez
FRENCH KONGO
Kongo R.
KONGO STATE
Loanda
ANGOLA
Benguela
Mossamedes
C. Frio
DAMARA LAND
Walfisch B.
GT. NAMAQUA LAND
KALAHARI DESERT
BRITISH BECHUANA LAND
S. AFRICA REPUBLIC (TRANSVAAL)
WEST GRIQUA LAND
ORANGE FREE STATE
P. Nolloth
Delagoa Bay
Durban (P. Natal)
CAPE COLONY
Cape Town
C. of Good Hope
Algoa
Alfred
Elizabeth
Humansdorp
Mossel Bay
E. London
MATABELE LAND
GASA LAND
MOZAMBIQUE
Mozambique
ZANZIBAR
Comoro
Mayotta
MADAGASCAR
SOMALI
ABYSSINIA
Massaua
Sawakim
Kunfida
Lobeiya
Hodeida
Zubeit
Asab
Perim I.
Aden
Obokh
WADAY
DARFUR
SOUDAN
TERU
St. Paul
Ascension I
St. Helena
Tristan da Cunha
Marion I.
SOUTH ATLANTIC OCEAN

SOUDAN
WADAY
DARFUR
ABYSSINIA
SOMALI
ARABIAN SEA
BAY OF BENGAL
ANDAMAN IS
NICOBAR IS
LAKADIVE IS
MALDIVE IS
Bombay
Berhampore
Chicacole
Vizagapatam
Cocanada
Masulipatam
Nellore
Madras
Pondicherry
Negapatam
Jafnapatam
Trincomali
CEYLON
Batticaloa
Vengurla
Goa
Kumpla
Mangalore
Tellicherry
Beipur
Cochin
Quilon
Nagercoil
C. Comorin
G. of Manar
Colombo
Pt. de Galle
Acheen Hd
Sawakin
Kunfida
Massawa
Lobeiya
Hodeida
Zubeit
Aden
Perim I.
Obokh
Asab
Berbera
Ras
Tounguru
Bassein
Diamond I.
Moulmein
Elephant I.
Amherst
Tavoy
Sinhyoochi
Penang
Medang
Singkel
Tapanuli
Benkulen
Padang
Telok
Kamp
GUD
MALAT PEN
BAN
U I N
ASHANTI
TOGO
HARMATTAN
Lagos
Bonny
Grand Bassam
Elmina
Cape Coast Castle
Akra
KAMERUN
Fernando Po
Princes I
St. Thomas
Gabun R.
Libreville
C. Lopez
FRENCH KONGO
KONGO STATE
Kongo R.
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Benguela
Mossamedes
St. Helena
C. Frio
MATABELE LAND
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Walfisch B.
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KALAHARI DESERT
BRIT. BECHUANA LAND
S. AFRICA REPUBLIC (TRANSVAAL)
ORANGE FREE STATE
Delagoa Bay
Durban (P. Natal)
P. Nolloths
CAPE COLONY
Cape Town
C. of Good Hope
George
Mossel Bay
Alfred
Elizabeth
Humansdorp
E. London
ZANZIBAR
SEYCHELLE IS
Mahe
CHAGOS ARCH'GO
Diego Garcia
Comoro
Mayotta
Diego Saurez
Nossi Bel
Mozambique
MOZAMBIQUE
St. Mary I.
ANTANANARIVO
MADAGASCAR
Mauritius I.
P. Louis
Mahebourg
Reunion
INDIAN OCEAN
St. Paul.
Crozet Is
Marion I.
KERGUELEN I.
H
T I C
N
unha

XUM

ARABIAN SEA
BAY OF BENGAL
INDIAN OCEAN
CHINA SEA
SOUTH CHINA SEA
JAVA SEA
SULU SEA
CELEBES SEA
ARAFURA SEA
CORAL SEA
AUSTRALIA
PHILIPPINE IS
BORNEO
PAPUA OR NEW GUINEA
CAROLINE ISLANDS
MARIANA OR LADRONE IS
Bombay
Madras
Pondicherri
Negapatam
Jafnapatam
CEYLON
Trincomali
Batticaloa
Colombo
Pt de Galle
C Comorin
Gulf of Manar
LAKADIVE IS
MALDIVE IS
CHAGOS ARCH'GO
Diego Garcia
NICOBAR IS
ANDAMAN IS
Acheen Hd
Penang
Malacca
Singapore
Sarawak
Brunei
Kudat
Sandakan
Labuan
Balikpapan
Pontianak
Bandjermassin
Makassar
Amboina
Timor
Kupang
Dobbo
Aru Is
Timor Laut
Thursday I
Admiralty Is
NEW MECKLENBURG
NEW POMERANIA
BOUGAINVILLE
Treasury I
Torres Strait
York
Cooktown
Cairns
Townsville
Mackay
Rockhampton
Gladstone
Sandy C
Maryborough
Gympie
Brisbane
Heads
Grafton
Kempsey
P Macquarie
Newcastle
Sydney
Kiama
Moruya
Eden
Gabo I
Melbourne
Portland
Robe
C Borda
Pt Lincoln
Adelaide
Wellington
Waltaroo
Wakefield
Wilson
Augusta
Cowell
Streaky B
Fowler Bay
Eyres
Israelite B
Esperance B
Albany
Pt D'Entrecasteaux
Perth
Fremantle
Peel Inlet
Bunbury
Busselton
Geraldton
Dongarra
P Gregory
N.W. Cape
Shark's B
Roebourne
Derby
Broome
Darwin
Palmerston
Yam Cr
Katherine
Gulf of Carpentaria
Burketown
Kimberly
Alice Springs
Charleville
Mattalburra
St Lawrence
Bowen
Bloomsbury
Mackay
Cardwell
Townsville
Cooktown
Cairns
Coen
Melville
Macquarie Hbr
Oyster B
TASMANIA
Hobart
St Paul
KERGUELEN I
Mahebourg
P Louis
Reunion
SEYCHELLE IS
Bangkok
Saigon
Hue
Tourane
Haifong
Namdinh
Vinh
Hainan
Kiungchau
Swatow
Amoy
Foochow
Wenchau
Quinhon
Yunnang B
Kampot
St James
Jaques
Diamond I
Bassein
Moulmein
Tavoy
Mergui
Elephant R
Amherst
Siuhyoohin
Berhampur
Chicacole
Vizagapatam
Cocanada
Masulipatam
Nellore
Vengurla
Goa
Kumpla
Mangalore
Cochin
Quilon
Nagercoil
Beypur
Tellicherri
Sangor I
False Pt
Akyab
Ruc
Tounggup
Manila
Albay
Aparri
Vigan
Bolinao
Langayen
Lanag
Yba
Iloilo
Jolo
Basilan
Isabela
G of Davao
Labuan
Brunei
Kema
Gilolo
Ternate
Gorontalo
Amboina
Ceram
Gisser I
Banda
Buton I
Flores
Sumbawa
Lombok
Bali
Sumbawa
Sandalwood I
Timor
Kupang
Batavia
Samarang
Surabaya
Banjuwangi
Benkulen
Telok Betung
Anjer
Padang R
Jambi
Rhio
Singkel I
Tapanuli
Medane
Penang
Malacca
Pulo Nias
Yap
Pelew Is
Meoko Hbr
Blanche B
Gulf Papua
Torres Strait
Admiralty Is

AUSTRALIA

St Lawrence
Mattaburra
Alice Springs
Rockhampton
Gladstone
Sandy C
Maryborough
Charleville
Gympie
Brisbane
Heads
Grafton
Kempsey
P. Macquarie
Newcastle
Sydney
Kiama
Moruya
Edan
Gabo I
Melbourne
Sale
Lambo
Port Albert
Port Welson
Wilsons Prom
Warrnambool
C. Otway
Portland
Mc Donnell
Robe
C. Bunk
C. Borda
Pt Lincoln
Adelaide
Wellington
Waikaree
Waterfield
Cowell
Ellistun
Streaky B
Eyre
Israelite B
Esperance B
Bucla Hbr
Fowlers Bay
Wilson
Augusta
New Heads
TASMANIA
Oyster B
Macquarie Hbr
Hobart
Macquarie I

NEW ZEALAND

KERMADEC IS
CHATHAM IS
Mongonui
Hokianga
Warkworth
P. Russell
Whangerei
Auckland
Tokota
Grahamstown
Mahotu Cove
Opotiki
Gisborne
P. Napier
N. Plymouth
NORTH I.
Wellington
Wanganui
Collingwood
Nelson
Westport
Charleston
Greymouth
Hokitika
Blenheim
Kaikoura
Keithfield
Christchurch
Akaroa Hbr
Ashburton
Timaru
Oamaru
Palmerston
Dunedin
Balclutha
Bluff Hbr
Invercargill
SOUTH I.

Nimrod

ANTARCTIC CONTINENT

EXPLA

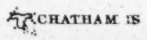
COALING FACILITIES C¹ Represents
C² "
C³ "

DOCKING FACILITIES D¹ Represents
D² "
D³ "
D⁴ "
S¹ "
S² "
S³ "

REPAIRING FACILITIES R¹ Represent
R² "
R³ "

30°
40°
50°
60°
69°
120°
130°
140°
150°
160°
170°
180°
170°
160°
150°
140°

Division of Chart Construction, G W Littlehales, Assistant in Charge



S O U T H P A C I F I C

O C E A N

Easter I.

Juan Fe

EXPLANATION OF SYMBOLS

COALING FACILITIES
- C^1 Represents a 1st class coaling station where 1000 tons or more can be procured.
- C^2 " 2d " " " " 500 to 1000 tons " "
- C^3 " 3d " " " " 100 " 500 " " "

DOCKING FACILITIES
- D^1 Represents a 1st class dock for vessels 340′ x 60′ x 21′ or larger.
- D^2 " 2d " " " " 270′ x 50′ x 18′ " "
- D^3 " 3d " " " " 250′ x 40′ x 15′ " "
- D^4 " 4th " " " " 150′ x 30′ x 12′ " "
- S^1 " 1st " slip " " of 2000 tons or more.
- S^2 " 2d " " " " " 1000 to 2000 tons.
- S^3 " 3d " " " " " 500 to 1000 "

REPAIRING FACILITIES
- R^1 Represents machine shops for building engines and boilers of high power.
- R^2 " " " " ordinary repairs to hull and machinery.
- R^3 " where only the most indifferent repairs can be made.

Nimrod

Dougherty I

NAT. GEOG. MAG.
VOL. VII, 1896, PL. X.

170° 180° 170° 160° 150° 140° 130° 120° 110° 100° 90°

XUM

P A C I F I C

E A N

A T

N OF SYMBOLS

oaling station where 1000 tons or more can be procured.
" " " 500 to 1000 tons " "
" " " 100 " 500 " " "

lock for vessels 340′ x 60′ x 21′ or larger.
" " " 270′ x 50′ x 18′ " "
" " " 250′ x 40′ x 15′ " "
" " " 150′ x 30′ x 12′ " "
lip " " of 2000 tons or more.
" " " " 1000 to 2000 tons.
" " " " 500 to 1000 "

ops for building engines and boilers of high power.
" ordinary repairs to hull and machinery.
he most indifferent repairs can be made.

Dougherty I

Guasco
La Serena
Valparaiso
SANTIAGO
Juan Fernandez
La Constitution
Concepcion
Arauco
Lebu
Imperial
Tolten
Valdivia
Pto. Montt
Ancud
CHILE
ARGENTINA
Laguna
Torres
Conceição do Arroio
Tramandahy
R. Grande do Sul
URUGUAY
Uruguay R.
BUENOS AIRES
La Plata
MONTEVIDEO
Maldonado
Lavalle
Mar del Plata
Necochea
Mercedes
Bahia Blanca
Rio Negro
Sarena
FALKLAND IS
P. Stanley
C. Virgins
MAGELLAN ST
Sandy Pt.
TIERRA DEL FUEGO
Staten I
Cape Horn
SOUTH GEORGIA
SANDWICH GROUP
SOUTH SHETLANDS
SOUTH ORKNEYS
GRAHAM LAND

EOG. MAG.
1896, PL. X.

30° 120° 110° 100° 90° 80° 70° 60° 50° 40° 30°

U.S Department of the Navy, Bureau of Navigation.
Published at Washington, D.C., Feb., 1896,
AT THE HYDROGRAPHIC OFFICE,
Charles D. Sigsbee, Commander U.S.N., Hydrographer.

XUM

Guasco
La Serena
Valparaiso
SANTIAGO
Institution
Arauco
Imperial
Tolten
Valdivia
Pto. Montt
CHILE
ARGENTINA
BUENOS AIRES
La Plata
Mercedes
Bahia Blanca
Rio Negro
Laguna
Torres
Conceição do Arroio
Alegre
R. Grande do Sul
URUGUAY
Uruguay R.
Maldonado
MONTEVIDEO
Lavalle
Mar del Plata
Necochea
Sirena
FALKLAND IS
P. Stanley
C. Virgins
MAGELLAN ST
Staten I
TIERRA DEL FUEGO
Cape Horn
SOUTH SHETLANDS
GRAHAM LAND
SOUTH ORKNEYS
SOUTH GEORGIA
SANDWICH GROUP
Bouvet I
Tristan da Cunha
A T L A N T I C
O C E A N
P. Nolloth
ORANGE FREE STATE
CAPE COLONY
Cape Town
C. of Good Hope
Alfred
E. London
Elizabeth
Humansdorp
Mossel Bay
70°
60°
50°
40°
30°
20° West Longitude 10°
Meridian of 0° Greenwich
10° East Longitude 20°
30°

U.S. Department of the Navy, Bureau of Navigation,
Published at Washington, D.C., Feb., 1896,
AT THE HYDROGRAPHIC OFFICE,
Charles D. Sigsbee, Commander, U.S.N., Hydrographer.

XUM

U T H

A N T I C

E A N

Walfisch B

KALAHARI DESERT

GT NAMAQUA LAND

BRIT BECHUANA LAND

WEST GRIQUA LAND

S. AFRICA REPUBLIC (TRANSVAAL)

ORANGE FREE STATE

CAPE COLONY

Delagoa Bay

Durban (P Natal)

P Nolloth

Cape Town

C. of Good Hope

Georg

Mossel Bay

Elizabeth

Rumansdorp

Alfred

E. London

Tristan da Cunha

Reunion

St. Paul

Marion I.

Crozet Is

KERGUELEN I.

Heard I

Bouvet I

Longitude 10° Meridian of 0° Greenwich 10° East Longitude 20° 30° 40° 50° 60° 70° 80° 90°

XUM

AUSTRALIA.

Shark's Bay
P. Gregory
Geraldton
Dongarra
Perth
Fremantle
Peel Inlet
Bunbury
Busselton
Albany
Pt. D'Entrecasteaux
Bremer B
Esperance B
Eyres
Euola Hbr.
Isovelite B
Fowler Bay
Streaky B.
Wilsons
Cowell
Elliston
Augusta
Waltaroo
Wakefield
Adelaide
Welington
Pt. Lincoln
C. Borda
Robe
Mc Donnell
Portland
Melbourne
Eden
Gabo I
Sale
Port Albert
Port Welsom
C. Otway
C. Shank
Low Heads
TASMANIA
Oyster B
Macquarie Hbr.
Hobart
Charleville
Gladstone
Sandy C
Maryborough
Gympie
Brisbane
Heads
Grafton
Kempsey
P. Macquarie
Newcastle
Sydney
Kiama
Moruya

St. Paul.

KERGUELEN I.

Heard I

Macquarie I.

ANTARCTIC CONTINENT

30° 40° 50° 60° 69°

60° 70° 80° 90° 100° 110° 120° 130° 140° 150° 160°

Drawn by H.G. Brewer. Engraved by C.E. Burch, J.A. Waddey and R.E. Gray

No. 1530

XUM

PETER COOPER AND SUBMARINE TELEGRAPHY

In presenting to its readers a chart of the submarine telegraph cables of the world, THE NATIONAL GEOGRAPHIC MAGAZINE was unwilling that this graphic representation of intercontinental communication should be unaccompanied by some reference to one of its earliest and most effective pioneers, the late Peter Cooper. It is well to recall to the rising generation its indebtedness to Mr Cooper for his eminent services in fostering the initiation of this now elaborate network between the widely separated continents of the earth. With considerable reluctance, and only after repeated urging, one of the actors in this great work, the Honorable Abram S. Hewitt, has outlined, in a letter all too brief, the part played by Mr Cooper. The letter is as follows:

"The story of the Atlantic Cable has been so fully and so well told by the Rev. Henry M. Field in his history, published in 1892 by Messrs Scribner & Sons of this city, that only the briefest outline is necessary to call public attention to the origin of an enterprise which, at the time of its inception, was regarded with incredulity, and whose prosecution and final success have all the elements of a romance.

"My first knowledge of the enterprise was in 1854, when Mr Cyrus W. Field invited Mr Peter Cooper and other gentlemen to listen to the propositions of Frederick N. Gisborne, who had come to New York for the purpose of interesting capital in constructing a line of telegraph across Newfoundland, so as to get the news at cape Race from the European steamers and transmit it thence overland to the gulf of St. Lawrence and thence by fast steamers to cape Breton, whence land lines had been constructed connecting with our American system. In that interview no suggestion was made for a cable across the gulf of St. Lawrence, because it was doubtful at that time whether submarine communication of such length could be established and maintained. The amount of money required was not very considerable, and the gentlemen appealed to, being all men of large views, came to the conclusion that they would contribute the amount, not so much as a commercial speculation as from considerations of the advantage of early news in business transactions affecting the two continents. The Newfoundland Company

was organized, with Mr Cooper as its president and Mr Field as its active manager. The other gentlemen concerned in the undertaking were Moses Taylor, Marshall O. Roberts, Chandler W. White, and, at a later period, Wilson G. Hunt. David Dudley Field also took an interest and was legal advisor of the company.

"Arrangements were made for the construction of the land line without delay, and later, when the experience of the European submarine cables established the practicability of longer lines, it was decided to lay the cable across the gulf of St. Lawrence, a distance of about eighty miles. The first attempt to lay this cable was a failure, owing to the imperfect arrangements for transporting the cable across the gulf, and the occurrence of a storm which caused the severance of the cable when the vessel engaged in laying it was midway between the two termini. It was determined, however, to renew the attempt, and in the following year a cable was successfully laid, and the original plan of the company for intercepting news at cape Race was carried into effect. As a matter of course, the enterprise was not a commercial success, but its advantages were so apparent that the parties in interest concluded that the time had come to make the attempt to continue the cable from Newfoundland to the coast of Ireland. The idea was a daring one; but the highest electrical authorities concurred in opinion that it was feasible. Mr Field proceeded to England to organize a company, in which he succeeded, and which resulted in the attempt to lay the cable in 1857, made by the *Agamemnon* on the British side and by the *Niagara* on the American side. I need not rehearse the story of the successive failures, but the first one occurred in 1857, during the panic of that year, which spread wide ruin throughout the country. Among others, Mr Field was compelled to succumb, and it seemed probable that any further attempt to construct and lay the cable would be abandoned. It was at this juncture that the strong common sense and unshaken faith of Peter Cooper came into play. When the financial storm had abated, he urged Mr Field to undertake the resuscitation of the enterprise, and he offered to advance, and actually did advance, the money required for Mr Field's expenditures, until such time as the success of the cable might be demonstrated and assured. Some of the other gentlemen declined to participate in these advances, and hence the burden upon Mr Cooper was very onerous and gave great concern to his family. Nevertheless Mr Field soon recovered his confidence, and with indomitable courage

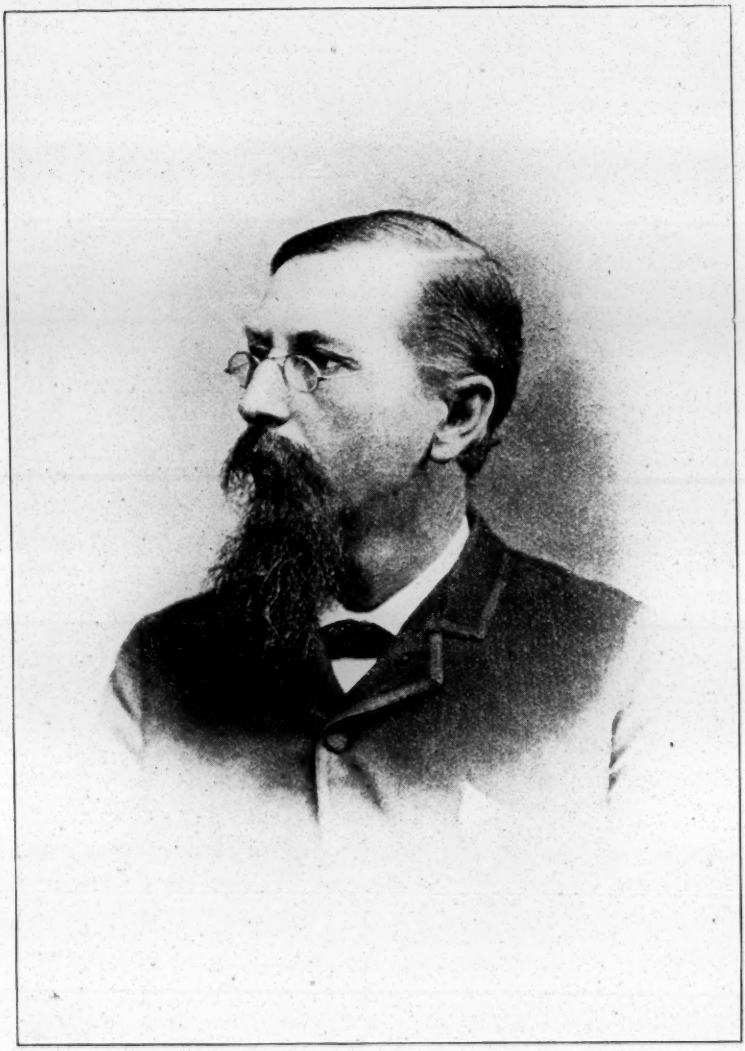
and indefatigable industry he finally succeeded in accomplishing the difficult undertaking with which his name and fame are justly identified. So far as Mr Cooper and his family were concerned, they did what they could to secure the success of the enterprise, and I think it may be justly asserted that, without Mr Cooper's assistance and absolute faith in the final success of the undertaking, its realization would have been postponed for many years. In the end he was fully indemnified, and perhaps amply rewarded, for his investment, but without detracting in the slightest from the credit which is justly accorded to Mr Field, I think I am justified in making, at your request, this brief statement, in order to show that without the unflinching courage and coöperation of Mr Cooper, Mr Field would hardly have been in a position to achieve the triumph which he finally secured, and for which his memory is entitled to the veneration of succeeding generations."

THE RUSSO-AMERICAN TELEGRAPH PROJECT OF 1864-'67

By Professor William H. Dall

The possibility of constructing a line of telegraph overland through Siberia and northwestern America had doubtless occurred to many, but the first person to endeavor to give practical effect to the conception appears to have been Mr Perry M. Collins, of California, who in 1856 and for some years subsequently was United States consular agent at Nikolaievsk, on the Amur river, eastern Siberia. By dint of constant activity and perseverance, Mr Collins succeeded in obtaining the concessions necessary to the construction of a line of telegraph, with all needful accessories, from the Amur to the British Columbian line through eastern Siberia and the Russian-American colonies, and also through the British territories in America.

Continual mishaps in the course of the attempts to lay a workable cable across the Atlantic had led many telegraphers to believe that the plan was impracticable, though they had no doubt of their ability to construct and keep in working order shorter lines, such as that proposed across Bering strait. The propositions of Mr Collins were laid before the Directors of the Western Union Telegraph Company, March 16, 1864. They ac-



WILLIAM H. DALL

cepted, by a unanimous vote, the transfer of his rights and interests, and on March 18 completed an organization for the carrying out of the project.

An expedition to explore the proposed route, under Col. Chas. S. Bulkley, formerly of the United States military telegraph corps, was immediately organized. Col. Bulkley reached the Pacific coast in January, 1865. The exploration of the British Columbian line was directed by Edmund Conway, that of Russian America by Robert Kennicott and that of eastern Siberia by Sergius Abasa. The United States detailed Capt. C. M. Scammon, of the Revenue Marine Service, and two other officers to the fleet fitted out by the company, and the Russian government lent the aid of the corvette *Vsadnik*. The first visit was paid to the Russian authorities at Sitka in March, 1865. In July parties were on the way to Siberia, Alaska, and Bering strait. Explorations during this and the following season demonstrated the practicability of the route selected, and saw a small amount of line constructed, every endeavor being made to carry out the project.

In 1867 the Atlantic cable at last proved itself a working success. On the other hand, the experience gained by the expeditions sent out in connection with the Russo-American project showed that the maintenance of the projected line would be so expensive as to make it impossible for it to compete with the Atlantic cable, commercially. Consequently the company decided to withdraw from the enterprise and in the autumn of 1867 the parties returned to California.

The route chosen was up the valley of the Fraser river in British Columbia and down the Yukon to the Nulato bend, thence across country to Port Clarence, where a cable was to connect with the Siberian lines. The latter would leave the Chukchi peninsula, cross the neck of the peninsula of Kamchatka and skirt the shores of the Okhotsk sea, joining the Russian lines at Nikolaievsk. It is stated that a large part of the fourteen millions of dollars represented by the stock was actually expended in the work; at all events a large amount of money was spent, and the only returns were those public benefits implied by an increase of geographical and other scientific knowledge and the training of a number of explorers and investigators.

SURVEY AND SUBDIVISION OF INDIAN TERRITORY

By Henry Gannett,

Chief Topographer, United States Geological Survey

The condition of things in Indian Territory is anomalous. The Territory is an area of some 31,000 square miles, divided among what are called the Five Civilized Tribes—the Cherokees, Choctaws, Chickasaws, Creeks, and Seminoles—the reservation of each tribe being owned by the tribe. Such a thing as private ownership of land is unknown. Each individual entitled to do so is, however, permitted to take up and occupy any land which is not already occupied, but in so doing he does not acquire title.

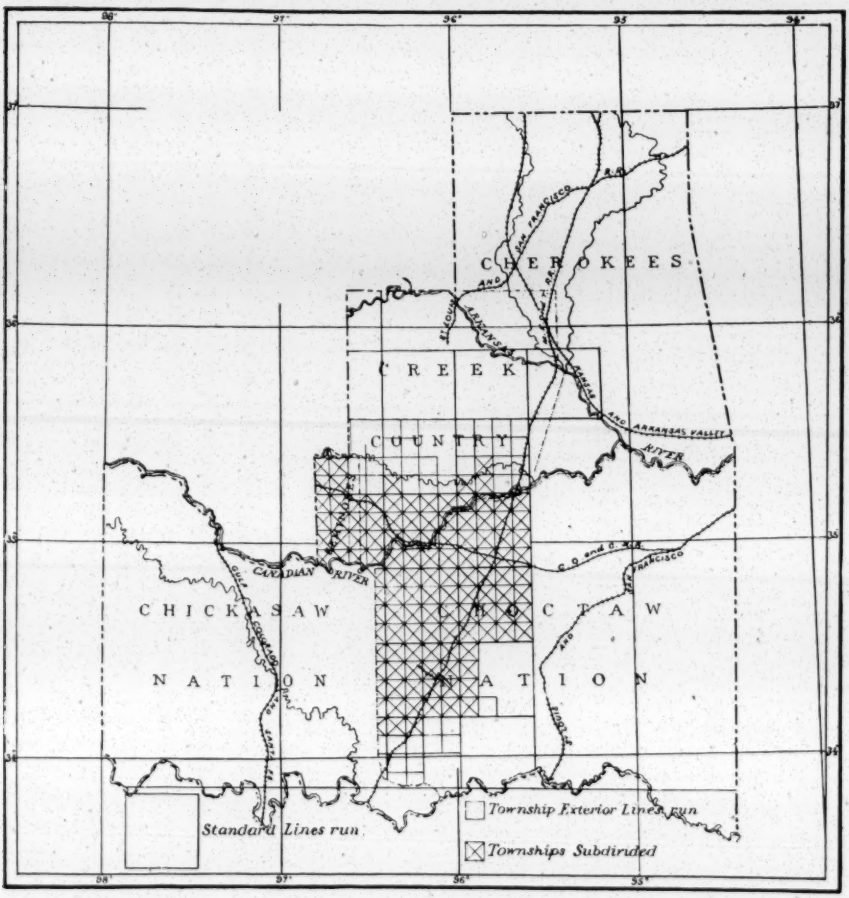
The population of the Territory consists of some 50,000 Indians, a few whites who have married Indian women and have thus acquired membership in the tribe, with the accompanying privileges and emoluments; a few thousand negroes, mostly the descendants of slaves, and a large number, variously estimated at from 100,000 to 200,000, of whites, who are living in the Territory on sufferance, some legally upon the payment of a small tax, others without the shadow of right or authority. These latter are known as interlopers.

As might be expected under this condition of affairs, the whites who have married Indian women, being much shrewder and more experienced than the Indians, have acquired by the right of occupation nearly all the landed property which is worth having in the Territory. They own, if it can be called owning, all the best farming and grazing land, all the timber land which is of immediate value, all the town sites, and all the mineral land which is worth having, and by leasing this property to whites they are rapidly acquiring great wealth.

Although in many respects quite advanced in the arts of civilization, the governments established by these Indians are weak and insufficient. So far as the control of the Indians themselves is concerned, they may have ample power, but at present they are called on to cope with and control a large body of whites, outnumbering themselves at least three to one, and composed largely of the rough, lawless, frontier element; indeed, were not the tribal governments reinforced by the power of the United

States courts the Territory would long ago have been in a state of anarchy.

This situation of affairs, instead of improving with time, is rapidly becoming worse, inasmuch as the number of interlopers in the Territory is constantly and rapidly increasing. The remedy



OUTLINE MAP OF INDIAN TERRITORY, SHOWING PROGRESS OF SUBDIVISION SURVEY UP TO JANUARY 1, 1896.

for this threatening aspect of affairs is plainly the substitution of a territorial government by all inhabitants for the present tribal governments of the Indian minority, the allotment of land to the Indians, and the consequent establishment of land titles.

Foreseeing the necessity of this solution, Congress has for the past two years been endeavoring to treat with the tribes for the

purpose of inducing them to accept their lands in severalty. In pursuance of this object two different commissions have been appointed, each of which has spent several months in the Territory endeavoring to obtain a hearing from the tribes, but thus far without the slightest result. The tribes have declined absolutely to treat with them upon this subject.

During the progress of these attempts at negotiation Congress has taken another step in the same direction. In March, 1895, an appropriation of $200,000 was made by Congress for commencing the survey and subdivision of the lands of the Territory, being the necessary preliminary step toward allotment. This work was placed by the Secretary of the Interior in the hands of the Director of the Geological Survey, instead of being let out on contract, as has been done in all cases of subdivision heretofore. The Chickasaw nation was excepted, as it was subdivided in 1873. The work was commenced in April under the following plan: The Indian base line, which forms the base line of the Chickasaw nation and of Oklahoma, was adopted for carrying the work into the other nations. The second guide meridian east of the principal meridian of the Chickasaw nation was run northward and southward as a principal meridian for the other nations. Thus while the general system of surveys conforms to that in the Chickasaw nation and in Oklahoma, the work has been so planned as to make it independent of any errors which may have accumulated in the earlier work.

Two parties have been engaged continuously since April last in running standard lines (guide meridians and correction lines) by which the country is divided into blocks twenty-four miles on a side. The township exteriors were run by distinct parties, two parties being at first organized for this work, which were subsequently increased to four. The subdivision of townships into sections was carried on by still a third set of parties, eight of which were organized and placed in the field during the month of May, and the number was subsequently increased to sixteen. Thus the entire work of subdividing the land is carried on by three distinct sets of parties, the work of each checking that of another.

Furthermore, a system of triangulation has been carried over the area subdivided, and the stations in this triangulation have been connected with section and township corners. This is done not only for the purpose of checking and correcting errors, but also to form reference points for the recovery of missing corners,

INDIAN TERRITORY — CAMP OF A SURVEYING PARTY OF THE U. S. GEOLOGICAL SURVEY, 1895

the triangulation points being marked in a very permanent manner. The triangulation rests upon a base line measured on the track of the Missouri, Kansas and Texas railway near Savanna, and the astronomical position of this place was determined as the initial position.

The subdivision parties, by which is to be understood the parties engaged in running the section lines, are grouped, four of them being in charge of an experienced surveyor connected with the permanent corps of the United States Geological Survey, who supervises the work closely and attends to the executive management of the outfit, and who, moreover, commonly with the aid of an assistant, maps the topography of the area subdivided. This latter duty is rendered light by the fact that the surveyor in running the lines locates the points of crossing of every stream, road, or other natural or artificial feature which he encounters in the course of his line. Thus at intervals of a mile or less all the features are located and little remains for the topographer to do except to sketch these features between these points of location.

The progress made in this survey up to the end of January of the present year is set forth in a report which has been made to the Secretary of the Interior. It appears from this that in the primary triangulation 49 stations have been selected, signals built upon them and angles measured from them. By means of these stations an area of about 10,000 square miles, or about five-twelfths of the area of the Territory, excluding the Chickasaw nation, has been controlled. In the subdivison work 11,770 miles had been run out of an estimated amount of 47,000 miles to complete the Territory, or about one-fourth of the entire work. Of the above mileage 970 miles are of standard lines—that is, standard parallels and correction lines; 1,790 miles are exterior lines of townships, 8,770 miles are section lines, and the remaining 240 miles are the meander lines of streams. The work thus far done completes the subdivision of 128 full townships and 26 fractional townships. It is included mainly in the western part of the Choctaw nation, embraces all of the Seminole country and some of the Creek country, while standard lines have been run into the Cherokee nation. The progress is represented upon the sketch map accompanying this paper.

The mapping of topography has followed closely after the work of subdivision, and up to the date given above an area of 4,200 square miles had been thus mapped.

"FREE BURGHS" IN THE UNITED STATES*

By James H. Blodgett,

Late Special Agent of Census in Charge of Education

Three bridges across the Potomac river connect the District of Columbia with the State of Virginia. The upper one, known as the Chain bridge, just below the Little falls, the head of tide-water, is too far from dense population to be frequented by foot passengers. Three miles below the Chain bridge is the Aqueduct bridge, practically the head of navigation, since only small pleasure boats and scows to bring stone from the quarries go above it.

Along the Virginia shore, above the Aqueduct bridge, are various "resort houses," more or less permanent, ostensibly for legitimate relaxation and pleasure, but viewed with suspicion by the authorities on both sides of the river, justified by results of occasional raids by officials. At the Virginia end of the same bridge is a straggling group of houses known as Roslyn, a favorite place for those who want to go beyond the police restraints of the District of Columbia, and particularly for those interested in the gambling device known as policy, a sort of lottery, especially attractive to the colored people.

Between the Aqueduct bridge and the Long bridge, two miles or more farther down, at the upper extreme of dense habitation, the low ground on the Virginia side is brushy, with but few houses, and is a rambling place for various kinds of boys and men, who find the towpath of the abandoned canal a convenient footway. The high lands contain the Government reservation, comprising Fort Myer and the Arlington national cemetery. Close to the Virginia end of the historic Long bridge are a few houses known as Jackson City. Freedom from rigid police control has made this a convenient place for gambling in various forms. Close by, known as Alexander's island, is maintained, irregularly, a race-course. Three miles farther is another race-course, known as St. Asaph. A good part of the racing in sight

*This article, written for The National Geographic Magazine, is less technical and has less of legal citation and quotation of authorities than a paper bearing the same title read before the Anthropological Society of Washington, November 5, 1895. The latter, valuable for purposes of reference and verification, will be printed by the American Historical Association.

of the Capitol has been that known as "outlaw racing"—that is, with horses or with jockeys not in good standing with the regular racing associations. Just below St. Asaph is the city of Alexandria, which is popularly regarded as a part of Alexandria county, to share whatever of good or bad repute attaches to it.

At the census of 1790 all this vicinity was part of Fairfax county, except that Alexandria already had a separate court and was exempt from county taxes. For the organization of the District of Columbia, Virginia ceded to the General Government the jurisdiction* over a tract bounded by the line extending ten miles northwest from the mouth of Hunting creek, a line northeast from the terminus of the first, and the river, containing an area said to be thirty-two square miles. In 1801 Congress erected the area ceded by Virginia into a county, to be called Alexandria county, but expressly retaining for Alexandria all existing chartered rights. In 1846 the United States re-ceded the tract to Virginia, which has continued to be generally known as Alexandria county, though the policy of separation of city and county, suspended for half a century, has been renewed. The combined population of city and county in 1890 was 18,597, of which 14,339 persons were in the city of Alexandria, which is not a part of Alexandria county, although its name, its vicinity, its recent affinity with the county, and the presence of the county buildings† tend with most persons to make the residents municipally responsible for the unlawful conduct near by. Many persons, while rejoicing in the measure of success attained, do not see why the energetic governor of Virginia sent officers to break up disreputable practices in the county. They do not appreciate the weakness of the real Alexandria county when the gambling elements of the neighboring cities flow out upon it. It has but a little over 4,000 population (1890), of whom, after deducting 164 on the military reservation, over one-half (2,123) are of negro descent, and not yet of much proprietary responsibility.

Alexandria is but an example of the cities of Virginia from the earliest days. James City, better known as Jamestown, and now extinct, was established as the chief city in 1639. Williamsburg was set apart as a city, to be used for no other purpose whatever, and defined as the capital in 1699, and again in 1705, in advance of population. There was a general plan to put in each county

* The ownership remained in the existing proprietors. Certain authors erroneously state that the title or possession was transferred.

† A bill is pending for erection of county buildings outside of the city.

a similar town for commercial purposes, especially for warehousing and marketing tobacco. Norfolk, chartered as a borough in 1737, has lost that name, but its relations to the county are today like those of the original charter, gradually defined, strengthened, and confirmed, in points of dispute, in favor of the municipality. At first the Norfolk county buildings were in Norfolk, and a special clause in the charter reserved proprietary rights in them to the county. Later legislation authorized their sale and the erection of county buildings outside of Norfolk. The buildings are now in Portsmouth.

In 1776 many boroughs which had been given separate representation in the assembly were cut off by a law which prescribed that no borough with a population less, for seven successive years, than half that of any county should be separately represented. In the same year the delegate for William and Mary College, specified in its charter, was cut off.

In the state law for apportionment of members of Congress, 1892, the following names of cities are given separate from names of counties: First district, Fredericksburg; second, Norfolk, Portsmouth, and Williamsburg; third, Richmond and Manchester; fourth, Petersburg; fifth, Danville and the town of North Danville; sixth, Lynchburg, Radford, and Roanoke; seventh, Charlottesville and Winchester; eighth, Alexandria; ninth, Bristol; tenth, Staunton. To these are to be added Buena Vista, in the tenth district, chartered on the day of the approval of the apportionment bill, and Newport News, for which the bill was signed January 18, 1896. The conditions for the town of North Danville are in transition. It has been a town independent of Pittsylvania county, but judicially dependent on Danville. The name has recently been changed to Neapolis, and just too late for insertion here it will be determined by popular vote whether it shall be consolidated with Danville.*

In early days there was a disposition in certain other colonies to establish cities independent of counties. In New Jersey and in Maryland such early independencies as survived came under county control. In Pennsylvania the claims of Germantown to independence of the taxation of Philadelphia county were overruled by the governor. In Virginia, from the incorporation of James City (1639), it has been the steady policy to have the cities independent of the counties. It confuses some students

* By popular vote, on February 20, Neapolis is to become a part of Danville on July 1, 1896.

to find an occasional participation of urban residents and rural residents in local affairs, but on examination of charters it will be found that this extends only to subjects expressly named in any instance.

If one will examine the scheme of government for the city and county of St. Louis, Missouri (1876), he will find that *all* power of county officers was abrogated. The same act restored their power for the rural portion, now St. Louis county, leaving the city to be provided with a separate government in the same act. The situation in Virginia may be clearer if the legislature is deemed to have abolished all county authority in any city under consideration, and then to have restored by name such items of power as circumstances demanded.

The present cities of Virginia have the following characteristics:

The Code defines a city as a town having over 5,000 inhabitants and a hustings court, and defines a town as an incorporated town having less than 5,000 population.*

The cities have distinct courts. Their citizens do not pay county taxes on city property. They do not serve on county juries. Deeds and other papers affecting city property are recorded by city officers and not by county officers.

Generally, residents of cities do not participate in county elections. Exceptionally, they may hold county offices, more exceptionally, they may vote for county officers.

Generally, city police courts have jurisdiction one mile beyond corporate limits. Exceptionally, there is a limited concurrent jurisdiction of city and county courts, as over waters adjacent to the cities of Norfolk and Portsmouth and to Norfolk county.

Generally, the county and the city have each a set of public buildings within their respective borders. Exceptionally, authority is given to a county for buildings in a city, as when, at the chartering of the city of Manchester, Chesterfield county was authorized to continue to use its public buildings therein till other arrangements could be made. This authority sometimes embraces arrangement for joint occupancy, as when Norfolk county was authorized to arrange with the city of Portsmouth for the location and construction of a jail.

Generally, a county officer may not serve writs in a city. Exceptionally, he can serve writs in the city on residents of his

* The venerable city of Williamsburg has a smaller population, but its site is expressly set apart for a city.

county, as witnesses may be summoned for Campbell county in the city of Lynchburg.

Except for individually specified purposes, county and city are as distinct as two counties.

The city of Newport News, Virginia, was organized January 20, 1896, under a charter naming officers to serve till July. The charter contains the following paragraph:

"115. The city of Newport News, its real and personal property and other subjects of taxation, and its inhabitants shall be exempt from all assessments and levies in the way of taxes imposed by the authorities of Warwick county for any purpose whatever, except upon property owned in the said county by the inhabitants of said city, from and after the first day of January, eighteen hundred and ninety-six, nor shall said inhabitants be liable to serve upon juries or work upon roads in said county except in such cases as are provided for by the laws of the state."

This extract states an exemption of residents in cities from county taxes and from duty on county juries prevalent in the state.

The present facts regarding the cities of Virginia are little known beyond the state. The Congressional Directory is conspicuous as a public document out of the state that shows the cities separately. The Civil Service Commission has found it necessary to recognize the certificate of an officer of a city court of record for Baltimore, St. Louis, and the cities of Virginia where a certificate from a county court was contemplated. A list of cities in Virginia paying no county taxes occurs in the Report of the Tenth Census (1880), volume 7, page 117.

Ordinarily, in this country, a city is part of a county; it is set apart that a dense population may establish new values and impose new taxes to meet special demands for public welfare; it continues to pay county taxes.

The difficulty of harmonious action by sparse and dense populations upon subjects common to them has led to exceptional separation of cities from counties—Baltimore, Maryland, by successive steps, culminating in 1823, and St. Louis, Missouri, through popular vote in 1876.

These two instances are explained in the Johns Hopkins University studies in historical and political science—Local Institutions of Maryland, in volume 3, and City Government of St. Louis, in volume 5, the latter being most minute, and con-

stituting a monograph in itself, and yet the existence of cities independent of county control and of county taxes is denied in certain histories and works on civil government used in high schools, colleges, and universities.

In many states the administration of the public schools is largely through municipalities charged with that work and superimposed upon areas occupied by other municipalities charged with other interests. There is a very general tendency to charter school districts independent of the town in the north or of the county at the south. In some states this method of enabling a community to do what the larger unit of which it has been part is not ready to do bids fair to increase. This form of legislation is more common in the west and south than in the northeast. The forms which these educational municipalities assume are numerous, and the complications produced are often intricate.

The complications are probably most intricate in those states formed of the public domain which have township organization, a modified form of the town government of New England. It will be most convenient to limit illustration to the organizations which possess taxing powers, disregarding subdivisions made simply for details of administration of a larger unit, like a voting precinct as a division of a county without taxing power. National, state, and county taxes bear upon property-owners throughout the country, with the exception of county taxes in St. Louis, Baltimore, and cities of Virginia, as already explained. The national taxes are so largely collected on goods in bulk before their distribution that most consumers either do not recognize them or persuade themselves that somebody else pays them.

Below the county tax come the multitudes of variations. The congressional township of the land survey, six miles square, in its simplest organization became a school township—a plan encouraged by the grant to the state of a section or of two sections or square miles in a township for school purposes. This school corporation is often subdivided into districts, each with its taxing power. There are instances of superimposed incorporation of the town as a high-school district with taxing power. Turning from school administration, we find the same area made a civil township, with care of roads, the poor, and other subjects. Within this township may grow up a compact body of population to be chartered as a village, a town, or a city, according to circumstances, with taxing power for police and other purposes. In some instances, like Springfield, Illinois, these units will as-

sume the charge of schools; in others, like Aurora, Illinois, the city does not administer the schools, which remain under the districts into which the school township was divided.

A citizen may therefore find himself under three sets of taxes for schools—the township and the district for common schools and the high school township for its specialty. He may have in addition the civil township tax and the corporation tax. When the school district is given a charter making it independent of its town, the succession of taxes is modified. A volume would hardly suffice to instance all the variations and combinations of duties of the taxpayer in different states, or even in different parts of the same state, growing out of the separately chartered taxing powers and their limited independencies.

The cities of Washington, D. C., which has practically absorbed Washington county and become identified with the District of Columbia; Philadelphia, Pennsylvania; New York; Brooklyn (January 1, 1896), New York; New Orleans, Louisiana, coextensive with Philadelphia, New York, and Kings counties and Orleans parish respectively, but continuing to exercise some functions of counties, and San Francisco, California, identical with San Francisco county, represent simply a growth by which cities have filled county boundaries, and not an independence of counties.

GEOGRAPHIC LITERATURE

The receipt at a somewhat late hour of two important articles published in this number of the magazine has necessitated the holding over until April of the entire Department of Geographic Literature.

PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY, SESSION 1895-'96.

Special Meeting, January 31, 1896.—Vice-President Greely in the chair. Mr Richard Villafranca, Commissioner General from Costa Rica to the Atlanta Exposition, read a paper, with lantern-slide illustrations, on The Geography, People, and Resources of Costa Rica.

Regular Meeting, February 7, 1896.—Vice-President Merriam in the chair. Mr W J McGee delivered an address, illustrated by lantern slides (mostly from original photographs), entitled "A Sojourn in Seriland: Explorations among Hostile Savages of the Gulf of California."

Special Meeting, February 14, 1896.—President Hubbard in the chair. Commander Z. L. Tanner, United States Navy, described his cruise in command of the United States Fish Commission steamer *Albatross* from the north Atlantic to the north Pacific, via the strait of Magellan and the Galapagos islands. Practical details of the scientific work and views of the various ports visited were given by means of lantern-slide illustrations.

Regular Meeting, February 21, 1896.—President Hubbard in the chair. Hon. George C. Perkins, United States Senator, read a paper, illustrated by lantern slides, on California: her Geography, Scenery, and Resources.

ELECTIONS.—New members have been elected as follows:

February 3.—John M. Comstock, Dr F. P. Dewey, Herbert Forsyth, Capt. D. D. Gaillard, U. S. A., Edward M. Kindle, Gen. Nelson A. Miles, U. S. A., R. A. Pearson, W. S. Post, W. P. Robinson, Wm. A. Taylor, Col. W. B. Thompson, Thos. L. Watson, Hon. Andrew D. White.

February 14.—Dr J. O. Adams, W. H. Baldwin, Jr., Miss Amy M. Bradley, Levi J. Bryant, Mrs M. L. Byington, Mrs J. A. Campbell, Col. H. W. Closson, U. S. A., J. Ashley Cooper, Gen. W. P. Craighill, U. S. A., Claas Denekas, Pay Inspector L. A. Frailey, U. S. N., Chief Justice Melville W. Fuller, Col. D. S. Gordon, U. S. A., Dr Ida J. Heiberger, F. J. Heiberger, James G. Jester, Lieut. W. Lacy Kenly, U. S. A., Mrs W. H. Kerr, T. A. Lambert, James B. Lambie, Noble D. Larner, Daniel W. Lord, Wm. G. Lown, Samuel Maddox, Chas. Addison Mann, Jr., Edward J. McQuade, Hon. John L. Mitchell, U. S. S., W. Henderson Moses, Owen Owen, A. S. Perham, August Peterson, Dr Chas. V. Petteys, Robert A. Phillips, Mr J. B. Pioda (Swiss Minister), Rev. Philip M. Prescott, J. M. Rieman, John W. Saville, Thos. W. Smith, Capt. J. A. Snyder, U. S. A., W. E. Speir, Pearce Thompson, Capt. R. Vance, U. S. A., W. H. Veerhoff, Dr John E. Walsh, John Sidney Webb, Oscar W. White, Ernest Wilkinson.

OBITUARY.—General John Gibbon, a distinguished officer and gallant soldier, died in Baltimore February 6. Graduating at the United States Military Academy in 1847, he rose to be a brigadier-general in the regular Army and a major-general of Volunteers. Alike against the Seminoles in Florida and the Nez Perces and Sioux in the northwest, in the Mexican war and in the war for the Union, he served with conspicuous gallantry, winning distinction whether he was in command of a regiment, a brigade, a division, or an army corps. The most desperate battles of the army of the Potomac found him at the front, and he was severely wounded both at Fredericksburg and Gettysburg. As a man, General Gibbon was greatly respected, and The National Geographic Society deplores in his death the loss of a valuable member, who in the course of 45 years of active service had gained a practical knowledge of the geography of the United States such as few men have the opportunity of acquiring.

No one unacquainted with Professor W. H. Dall's earlier work as an explorer would imagine from the reading of his modest article on pages 110 and 111 that he himself bore an important and honorable part in one of the expeditions to which he refers. To all, however, except the younger generation, this fact is well known, as is the further fact that Professor Dall's continued explorations and researches in Alaska and the North Pacific ocean for the long period of 30 years have led to his recognition as one of the best informed men of the time on all matters relating to that most interesting and increasingly important section of the globe. After the abandonment of the overland telegraph project in 1867, Mr Dall remained for some time in Russian America, witnessing its transformation into Alaska as the result of its purchase by the United States. On his return, he published numerous articles of great scientific value, and in 1870 appeared his well known work on Alaska and its Resources. As an assistant in the U. S. Coast Survey from 1871 to 1874, he devoted himself largely to Alaskan studies, making repeated visits to the far north and publishing from time to time the results of his investigations concerning it. In 1884 he joined the U. S. Geological Survey, of which he has since remained an officer. He is also closely identified with the Smithsonian Institution, of which he is an honorary curator.

The proposal to establish a permanent directorship-in-chief of scientific bureaus and investigations in the Department of Agriculture, to give coördination and continuity to the many-sided scientific work of the Department and to complete the good work done by the present Secretary in protecting the scientific force from the onslaught of the political spoilsman, has excited great interest in the scientific world and called forth a very notable expression of favorable opinion from a large number of eminent scientists and scientific educators. Within a brief period—in fact, since February 18, President Gilman and the faculty of Johns Hopkins, President Dwight and the scientific faculty of Yale, President Schurman of Cornell, President Low of Columbia, President Adams of Wisconsin, President Francis A. Walker of the Boston Institute of Technology, Dr Shaler, dean of the Lawrence Scientific School at Harvard; Dr John S. Billings, of New York; the Joint Commission of the Scientific Societies of Washington, and the presidents and other officers of various state universities and colleges have given the proposal the very strongest indorsement. While the recommendation is scarcely likely to be favorably acted upon at the present session of Congress, it is too obviously a step in the direction of a more effective and at the same time more economical administration—too manifestly in the interest of good government in general—for its adoption to be long delayed.

A preliminary announcement of the Mexican census of 1895 gives a total population of 12,542,057, as against 9,908,011 at the census of 1879, and 11,632,924 as officially estimated in 1889. The population of the principal cities is said to be as follows: City of Mexico, 339,935; Puebla, 91,917; Guadalajara, 83,870; San Luis Potosi, 69,676; Monterey, 56,835; Merida, 56,702; Pachuca, 52,188; Durango, 42,166, and Zacatecas, 40,026.

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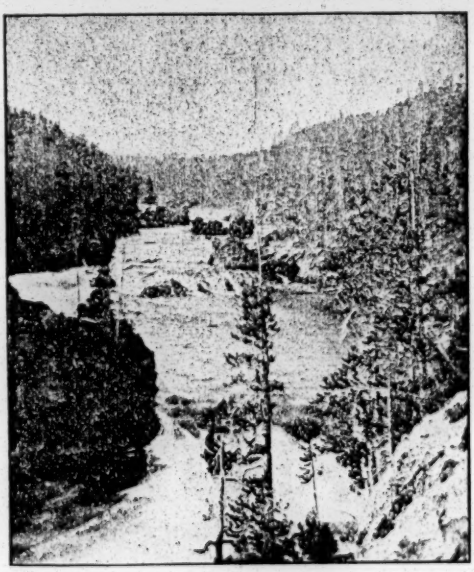

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